



Netherlands Enterprise Agency

>> Sustainable. Agricultural. Innovative.
International.

Who is who guide 2014

Players in the Dutch smart grid sector

commissioned by the Ministry of Economic Affairs

Who is who

The energy landscape is changing. We are increasingly using sustainable sources of energy. And, the generation of energy is increasingly decentralised.

On a global scale, energy consumption and especially the consumption of electricity continue to increase. Smart energy networks are needed in order to meet the increasing need for flexibility in the energy system and to balance supply and demand in a reliable and affordable manner, even in the changing circumstances.

Powerful boost

In the Netherlands, the development of smart energy networks is in full swing. Since 2010, the Dutch ministry of Economic Affairs has speeded up the development of smart grids with its Intelligent Grids Innovation Programme (IPIN, Innovatieprogramma Intelligente Netten). And in 2012 a national public private partnership, called Topconsortium Knowledge and Innovation (TKI), was founded under the Topsector policy of the government. TKI Switch2SmartGrids (TKI S2SG) sets up yearly programmes for smart grids activities based on an innovation contract and in co-operation with the players on the field.

In order to provide a powerful boost to large-scale application, the TKI S2SG programmes and IPIN are supporting R&D and pilot projects in residential areas, city centres, office parks, industrial estates and agricultural areas. There, front-runners are experimenting in realistic circumstances.

Diverse products and services

Dutch companies and institutes now offer diverse innovative

products, services and research with respect to smart grids. They have developed new business models, back-office systems, ICT services, energy management, power electronics, control systems and sensors. The companies and institutes active in smart grid innovation include engineers, ICT and energy companies, grid operators, consultancy firms and knowledge institutes. They are start-ups as well as established companies operating worldwide. They develop the building blocks of smart energy systems, actively involving the end users on a large scale.

Who's who in the smart grid sector?

This list of who's who helps you to navigate through the Dutch smart grids sector. It shows the important players. It lists the contact information for each company/institute, as well as which products and services they provide with respect to smart grids.

The companies and knowledge institutes are classified according to their expertise:

- Smart grids engineering
- Grid operation
- Consultancy related to smart grids
- ICT solutions concerning smart grids
- Energy supply and energy services
- Energy and smart grids research

To give an insight in the world of smart grids, the Netherlands Enterprise Agency created a [short animation movie](#). Take a look, get inspired and share it with your network.

For more information or any questions about this guide, please contact ipin@rvo.nl.

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[HAN Hogeschool van Arnhem en Nijmegen](#)

[Hogeschool Zuyd NEBER Centre of Expertise](#)

[HOMA BV](#)

[Honeywell BV](#)

[IBM Nederland BV](#)

[ICT Automatisering Nederland BV](#)

[iNRG | Energizing People](#)

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[Tilburg University](#)

[TKF](#)

[TNO](#)

[TU Delft](#)

[TU Eindhoven Built Environment](#)

[TU Eindhoven Electrical Engineering](#)

[UCPartners](#)

[Unica](#)

[University of Amsterdam Centre for Energy](#)

[University of Groningen \(RUG\) Distributed Systems](#)

[University of Groningen \(RUG\) Energy Law](#)

[University of Groningen \(RUG\) Environmental Psychology](#)

[University of Groningen \(RUG\) Systems and Control Engineering](#)

[University of Twente CTIT](#)

[UPC Business](#)

[Utrecht Sustainability Institute \(USI\)](#)

[Utrecht Universiteit / Copernicus Institute](#)

[Valstar Simonis BV](#)

[Wattcher BV](#)

[Westland Infra](#)

[Xemex NV](#)

ABB

COMPANY

ABB Group is a leader in power and automation technologies that enables utility and industry customers to improve performance while lowering environmental impact. The European leader in deploying and managing nationwide electric vehicle charging networks, ABB Electric Vehicle Charging Infrastructure (EVCI) has the world's largest web-connected installed base of DC fast charging stations and is best known for the uptime and reliability demonstrated by its charging solutions and for the companies longstanding leadership and 'commitment to excellence' within the EV charging industry. ABB charging stations are designed to enable and support smart grids.
www.abb.com/evcharging

The ABB Group of companies operates in around 100 countries and employs about 145,000 people.

PRODUCTS

ABB's EVCI product group offers a diverse portfolio of charging solutions to meet the needs of all EV drivers and business models



and includes a number of EV charging stations and network management tools. Every ABB charger comes complete with a package of connectivity-based services, including remote maintenance, remote diagnostics, smart grid functionalities as well as interfaces to service providers to enable subscriber management applications, all protected via the highest data security standard. This combination enables charge station operators and infrastructure providers to easily and efficiently manage a commercial business with functions such as billing, support and charge station authorization.

NETWORKS

ABB EVCI is the industry leader in installing and deploying nationwide EV charging infrastructures. To date, the product group has supported the creation of nationwide networks in China, Estonia, Ireland, Belgium, the Netherlands and Denmark. Active worldwide, ABB EVCI works closely with OEMs, EV charging infrastructure providers, utilities, and local governments and municipalities to support the mass adoption of electric vehicles.

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Alfen BV

COMPANY

For over 75 years, Alfen has been a trusted and recognized developer, manufacturer and supplier of high, medium and low voltage grid equipment in the Netherlands. The company is an international and innovative powerhouse as a turnkey supplier of substations including transformers, medium voltage (MV) systems and MV switchgears. Alfen is also active in design, production, installation, monitoring and maintenance activities.

Transformer substations have been Alfen's specialty for a long time, for individual deliveries as well as integration within complete projects. Apart from the products, the professional project organisation enables Alfen to provide customised solutions for a wide variety of situations. Thanks to the long-time experience with medium voltage systems, Alfen is able to act as a solution-focused knowledge centre when it comes to electrical networks for finding the best and most efficient solution for customers.

PRODUCTS

Alfen's product and services portfolio consists of a wide variety of categories including transformer substations, projects, special products, service and substation automation. The company is highly active in the field of smart grids with products, maintenance and innovations that contribute to Alfen's goal to optimise the medium voltage grid and work towards durable solutions.

Under the brand name of ICU, Alfen started developing and manufacturing charging stations in 2008. Since then the company has developed a complete range of charging solutions for public and private locations. ICU has become one of the most important international producers of charging stations with more than 2.500 charging locations throughout Europe.

NETWORKS

Alfen is a well-known player within the Dutch energy and infrastructure market and is one of the initiators of the Dutch Power

foundation. Alfen also participates in various projects with regard to Smart Grids and other solutions for the electrical grid.

PROJECTS

- Sustainable off Grid Power Station for Rural Applications (SOPRA)
- Smart Storage Unit
- Remote Fault Passage Indicators



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BeNext

COMPANY

BeNext is an independent innovation organisation specialised in intelligent homes. All disciplines are combined within one system; the house will become a truly intelligent home. BeNext's SUCCESS stands for: a Set Up for Climate, Control, Energy, Safety and Security. Customers can start small and grow to a complete Home Automation system. The company develops, produces and offers a variety of products and services to B2B partners (websites in the Cloud, API and Apps).

SERVICES

- **Climate Services**
Climate Services control the climate in a home. By using BeNext's climate products (such as the Radiator Control and Boiler Control) customers are able to set the ideal temperature for each room.
- **Control Services**
With Control Services customers can regulate control devices automatically, including closing the curtains at sunset or turning lights on and off.

- **Energy Services**
Energy Services give a full overview of energy usage. BeNext saves data to provide historical information and save energy. The service also gives advice based on personal situations.
- **Safety Services**
Safety Services provide help whenever needed. For instance, the Panic Watch warns neighbours or relatives when the button is pushed.
- **Security Services**
With security products, customers have a complete security system. With the Tag and the Tag Reader, arming and disarming the alarm system will be very easy. No need to remember any security codes.

NETWORKS

- Involved in FP7 projects
- P1 (DSMR) working group for Netbeheer Nederland
- Member of the Z-Wave Alliance
- Member of Smart Homes

PROJECTS

- Stroomversnelling, 111K energy neutral houses
- Amsterdam Smart City
- TU Delft "o"-energy
- School displays (energy, gas, water consumption and sun yield)
- Water pipe consumption (Waternet Drenthe)



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Betronic

COMPANY

Betronic BV is one of the cleantech companies in Amsterdam. Betronic designs and manufactures complete electronic-based products. Most of these products are part of solutions for challenges formulated by Urban Mobility & Smart Cities and involve energy, mobility and connectivity. These three elements are becoming more and more interrelated: 'The ever connected last mile transport powered by sustainable energy'. For every business (B2B2C) looking for smart, application-oriented electronics, Betronic takes care of the complete process from concept to production. From integrated product development and engineering throughout the implementation of the Supply Chain Management (SCM) worldwide. Betronic's objective is to develop products that are economical and efficient and find a good balance between functionality and product price for its partners.

PRODUCTS

The customers of Betronic are active in cleantech, energy, mobility and industrial

businesses. Betronic designs and produces Battery Management Systems for high power batteries (10kW), 2.4kW wind and PV grid-connected inverters, PFC systems, E-charging point support systems, motor control BLDC and PMAC up to 5kW. Additionally, Betronic provides energy monitoring services that can be fully customised.

- DC/DC converters AC/DC/AC inverters for sustainable energy sources
- Energy storage systems, charge point management for smart grid
- Full customisable (energy) monitoring services portal and back office
- Light Electric Vehicles: E-bikes, E-Scooter, E-step

NETWORKS

- CleanTech; research programme of Amsterdam University of Applied Sciences
- International cooperation (IPC, FP7)
- Horizon2020 projects
- DOET
- FHI
- Green Campus Delft
- High School of Amsterdam



PROJECTS

- E-mobility projects
- PV-Monitoring
- Battery Management Systems
- User interfaces
- Communication protocols
- Shenzi, office buildings; tomorrow's 'gasstations'

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Datawatt

COMPANY

Remote control, monitoring, supervision and automation are invaluable for processes to make sure the right information is available at the right place at the right time. Datawatt delivers technically advanced and innovative solutions for distribution infrastructures in the water, energy, oil and gas markets.

The reputation of Datawatt in the area of monitoring and remote control of geographically widespread processes is undisputed. Technically advanced and innovative solutions are applied in various smart grid networks. Datawatt develops RTU solutions (hardware), smart grid solutions (software), and uses this technology in turnkey solutions for grid operators.

Since Datawatt was founded in 1977, the company has been known for its reliable, knowledge-based developments and tailor-made or standard solutions for integrated process management. Our systems, expertise and experience are used to implement complex projects up to everyday facilities.

Sustainovation, protecting the environment and energy management are an integral part of our solutions.

Datawatt stands for high quality, reliability and a remarkable price quality ratio. At least as important is our compact organization and our short communication lines, which makes Datawatt an excellent partner when undertaking complex projects. To ensure our high level of service we are ISO9001:2008 and VCA** certified.

NETWORKS

- Dutch Power
- Standardization Commission NEC-IEC TC57 and TC5701
- NL Agency/Ministry of Economic Affairs (MS/LS instrumentation)
- Sensor Universe
- Energy force

PROJECTS

- Stedin; Tender for Remote fault passage indicators for MV network
- Eandis; D26 GPRS RTU's for tender Smart Grids

- Enexis; Distribution automation (DA) project
- Liandon; Supervision gas network project
- Tenergy; Meter reading and monitoring system
- Edmij; Emergency power pool project
- Cogas; Power quality Monitoring project
- Stedin; Local Data Acquisition System (LDAS) for gas stations



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Direct Current

COMPANY

Direct Current BV derives its experience and knowledge in the field of DC from a history of more than 25 years in developing and building converters and rectifiers for a worldwide market. Harry Stokman founded the company with the mission to develop the missing links in order to make a DC infrastructure possible. Therefore, a safe way to use DC has been developed and successfully implemented in ongoing DC projects.

Direct Current BV is also participating in the DC Workgroup NEC 64 for establishing safety standards for DC. In close collaboration with DC Foundation, TU Delft and The Hague University, programmes have been set up to educate students in DC, in order to increase awareness and knowledge with regard to DC. As the initiator of innovative projects and by collaborating with other organisations in several innovative DC projects, Direct Current BV has become a leading factor in DC smart grids in the Netherlands and abroad. In 2014 the book 'Groot Gelijk' was issued in

collaboration with RVO Nederland and DC Foundation, exhibiting the DC projects.

PRODUCTS

- DC drivers and systems for public lighting
- HID DC drivers for growth lights
- DC power routers for DC grids
- AC / DC and DC /DC converters
- Drive-train for EV

NETWORKS

- Founder and chairman of DC Foundation: www.gelijkspanning.org
- DC Workgroup NEC 64 and IEC Standards
- Delft University of Technology
- The Hague University
- National Workgroup Infrastructure D66
- Close cooperation with multinational organisations

PROJECTS

- DC=DeCent: the first actual DC grid worldwide
- EV drive-train
- DC public lighting
- Stroomversnelling (increase momentum):

- DC grids in homes
- DC on Ships
- DC grids in South Africa



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Dr. Ten

COMPANY

Dr Ten BV is a fast-growing company specialised in product – and project development. It works mostly in the area of water, food and renewable energy technology. The company has various scientists and engineers serving the world with clean water, energy and food. It was started by scientist and former speed skater Marnix ten Kortenaar. Dr Ten runs projects with multinationals, SME companies, the government, and knowledge institutes.

Dr Ten developed the so called sea-salt battery which won the Jan Terlouw Innovation Award in 2013 in the Netherlands. The battery stores solar energy, grid energy and wind energy in a reliable mode, at the lowest cost. The battery is green, as its main component is sea-salt which is released as a by-product in seawater purification.

Dr Ten also developed the water dome and a nano-silver process for filters, which enable low cost purification of salt water and bacteria. In addition, Dr Ten developed new

biologic food lipids that can be used in sports, dairy, health and infant nutrition.



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Eaton

COMPANY

Power management company Eaton is providing energy-efficient solutions that help their customers effectively manage electrical, hydraulic and mechanical power. The company is a global leader in electrical products, systems and services for power quality, distribution and control, power transmission, lighting and wiring products, as well as in hydraulics components, systems and services. With its activities in the utility world Eaton aims to design, build and maintain an automated, secure and cost-effective grid.

PRODUCTS

Eaton has products and services available to offer safe, reliable and connectible solutions from medium voltage level to socket outlet level in homes. The company develops its knowledge and experience of the future by participating in real life smart grid projects in at least three European countries. Based on the experiences and knowledge gained, Eaton will further develop its products, solutions and services for smart grid applications.



PROJECTS

- **Lochem Energie:** The realization of a fault free, safe and efficient Intelligent Grid is a key project for the city of Lochem, as a driver for sustainability in the Netherlands. It reflects the increasing number of decentralized renewable energy generation projects in the area; turning the residents into so-called prosumers (producer and consumer).
- Eaton and Cogas are studying the possibility of using UPS technology in order to improve power quality on LV feeders from a transformer station. In this context a pilot project has been set up in Almelo, a city in the east of The Netherlands.
- **KRIS:** Eaton is one of the participants in this project with seven Dutch utility companies and eight smart grid instrumentation manufacturers. The objective is to achieve a (TCO) cost reduction of smart grid instrumentation for installed base transformer stations, by introducing a modular platform using open protocols and a single communication pathway for various functionalities.

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Elspec

COMPANY

Elspec, formed in 1967, is a wholly-owned subsidiary of the TKH Group NV. In the world of electrical engineering, things are developing faster than ever. A primary requirement is to anticipate new trends and technologies. Elspec always opts for proven quality, in order to guarantee future-proof investments and reliable process control for the client. Elspec is an expert in the combination of technology that ensures an optimal infrastructure for data communication or energy distribution.

PRODUCTS

Elspec supplies products and solutions of Kries Energietechnik for monitoring voltage (without voltage transformers), failure detection, remote monitoring and control of switchgear in distribution networks.

NETWORKS

- Member of FEDET, DutchPower
- Participant in Smart Grids innovation contract within the TOP sectors of the government

PROJECTS

For a large energy company, Elspec has realized a distribution automation (DA) pilot for six substations, set in a ring structure. Elspec has performed the entire installation of the pilot phase in close collaboration with Kries Energietechnik. The stations are categorised as a strategic and nonstrategic. Parameters such as voltage, current and phase sequence are sent from the nonstrategic stations to the overlying Scada system, in accordance with the IEC 104 protocol and GPRS. Elspec has also equipped the strategic station with short-circuit and ground failure detection. Moreover, the cable fields of the system have been equipped with spring-charging motors, enabling remote switching of the cable fields. By working with a low-maintenance capacitive energy buffer, the motors of the cable fields can switch six times in the absence of station voltage.



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Femto**grid**

Energy Solutions BV

COMPANY

Femto**grid** is a power management technology company and provides solutions for distributed DC systems that improve the performance, reliability and safety of renewable energy installations in the built environment. Femto**grid** engineers smart electronics systems that, together with its 400 Vdc parallel system approach, generate up to 30 percent more energy harvest per installation. As a result, Femto**grid** reduces the payback time of renewable energy installations and decreases the global carbon footprint.

The company's focus is on the market for residential and small commercial rooftop (up to 50 kWp) installations. The Femto**grid** Solar System allows system integrators, installers and system owners/ end users to benefit from constraint-free roof design, full roof utilization, reduced installation time and total cost of ownership, module-level monitoring, improved safety, theft prevention and more.

NETWORKS

- EMerge Alliance
- TC/NEC 82

PROJECTS

- SolaRoad
- Smart Chain
- The Green Campus

PRODUCTS

The Femto**grid** Solar System is the solution for residential and small commercial rooftops (up to 50 kWp) installations, that improves the performance, reliability, safety of PV installations and the applicability of solar panels. The solution maximizes power generation for faster return on investment. The Femto**grid** Solar System is in itself a smart grid. It is a 400 Vdc bus system for solar panels with a parallel system architecture that optimizes every single DC source (the solar panel) individually that is connected to this bus. Smart electronics named 'Power Optimizers' are mounted behind every solar

panel to perform Maximum Power Point Tracking for that single solar panel in order to optimize the energy produced by the solar panel. This enables the mixing and mingling of different DC sources in one system. For example, solar panels of different quality, watt peak power, and type can be used in the same 400 Vdc bus system. But also different renewable energy sources.



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Fifthplay

COMPANY

Fifthplay is a major innovator and trendsetter in the field of smart energy. Fifthplay was founded in 2008 under the wings of the Niko Group with a clear mandate to devise and implement innovative solutions in the context of 'the smart building'. In addition to energy management hardware and software Fifthplay develops comprehensive solutions. Examples are remote monitoring of medical parameters of patients and convenience services within communities (smart cities).

NETWORKS

- Smart Grid Flanders
- Linear Smart Grid
- Agoria
- IFMA
- VOKA

PROJECTS

- Linear Smart Grid
www.linear-smartgrid.be/
- Electrabel Smart Energy Box B2C
www.electrabel.be/nl/particulier/gas-elektriciteit-stroom-leverancier-prijs-energie/smartenergybox
- Delta Lloyd B2B
www.youtube.com/watch?v=Ycj_eGLhUgc

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Flexicontrol

COMPANY

Flexicontrol emanates from an enterprise which has applied itself to the development of electronic products for industry in general, since 1985. Towards the end of the previous century, it began to focus on electronics applied in buildings. Since the beginning of this century, the company has been doing that under the name of Flexicontrol.

PRODUCTS

Flexicontrol brings to the market a standard range of products for immediate installation. These products are characterised by their integrated approach to the various disciplines within the building. This means that separate systems are no longer necessary for such things as air-conditioning, lighting and access control, instead only the single Flexicontrol system is needed, with all its additional advantages.

With its many years of experience in the industry, it is only a small step for Flexicontrol to move from this base to smart energy use. Flexicontrol took a first step in 1996 with the

development of its Energy Mirror for Ecofys, in partnership with NPK Industrial Design. The next step was the conception of the first integrated energy monitor for residential dwellings in the Netherlands: Marvin. This monitor won the Building Holland Award in 2010. The energy monitor controls the lighting, as well as integrating the boiler, intercom, security camera(s), email, and weather radar. In short: Flexicontrol integrates the various functions in dwellings. The objective is: Energy, Comfort and Safety. And our motto is: We make the difference for residents!



NETWORKS

- TEG
- M-net

PROJECTS

- Ecofys Energy Mirror
- Marvin energy monitor
- Flexicontrol building automation
- Wendy Home Gateway
- IPIN-project Your Energy Moment in Zwolle
www.jouwenergiemoment.nl/muziekwijk-zwolle

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Heliox BV

COMPANY

Heliox was formed in 2009. The core business of the company is the development and sale of high- performance power converters, for and to clients. These high-quality power convertors are relatively small and very energy efficient.

Moreover, the products can be made very compact and light by applying high-frequency electronic switching technology. This is not possible with more conventional techniques. The low weight and small dimensions of the product allow them to be used in e.g. chargers for electric vehicles, so that these vehicles can be charged via a smart coupling with the smart grid.

PRODUCTS

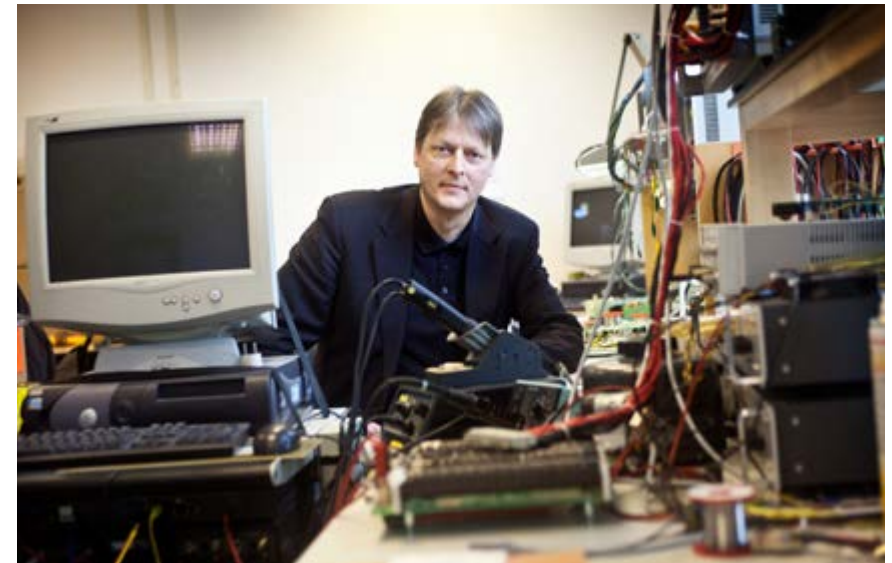
- Smart grid compatible micro-inverter for solar PV applications
- Smart grid compatible mobile charger for electric vehicles

NETWORKS

- Smart energy regions
www.smartenergyregions.com/
- Smart grids NL Agency
www.agentschapnl.nl/programmas-regelingen/intelligente-netten/

PROJECTS

- JU project Eniac: Energy 2 Smart Grid
www.eniac.eu/web/index.php



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Honeywell BV

COMPANY

Honeywell is a diversified technology company. It started in 1885 with initial technology patents. Honeywell is an Inc. with a listing on the NYSE (New York Stock Exchange).

Honeywell sells thousands of different technology products and solutions. More than 50% of its current portfolio offers energy-efficiency benefits. We offer a product or solution for any energy-efficiency need that you might have. For example: by immediately and comprehensively adopting existing Honeywell products, the United States was able to reduce energy consumption by 20-25%.

The famous Honeywell 'Round' thermostat is a Honeywell icon. It is one of the most recognised designs of the world. Its first versions date back to 1953.

PRODUCTS

From in-home energy-control products to demand-respond control solutions.

NETWORKS

Honeywell is a member of and contributor to most relevant industry, control technology, communication, protocol & business associations.

PROJECTS

www.kijkvoelbeleef.nl

www.trendcontrols.com

www.centraline.nl

www.honeywell-buildingsolutions.nl

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Imtech

COMPANY

Imtech provides integrated technological solutions using a multidisciplinary approach. It combines the spheres of electrotechnology, ICT and mechanical engineering and offers intelligent solutions in the building and industry markets - from consultancy and design to realisation, management and maintenance.

SERVICES

In the short and medium term, decentralised electricity generation from sustainable energy sources such as waste, biomass, wind, sun and water is rapidly increasing. Individual dwellings, housing estates, companies and/or business parks are increasingly generating their own electricity and at the same time are purchasing electricity, heating or gas. This creates traffic in two or more directions in energy distribution between dwellings and/or companies among themselves and energy companies. Moreover, large and small scale wind parks, waste-to-energy plants, biomass and biogas plants, or combined heating and power plants have to be fully integrated into

these energy grids. The result is a growing need for multi-energy distribution.

Imtech has the necessary disciplines in-house to design, realise, maintain and manage smart grids. As a technical developer, Imtech puts to use its knowledge of energy infrastructures, ICT, energy management systems, and (decentralised) energy solutions in the area of (decentralised) generation, as well as in distribution and delivery to buildings.

NETWORKS

- Smart Energy Collective: www.smartenergycollective.nl
- Energy Valley: www.energyvalley.nl

PROJECTS

- Power Matching City Hoogkerk
- IPIN Experiment - Intelligent Heating Network at the TU Delft campus
- IPIN Experiment – Schiphol GROUNDS (part of the SEC)
- ReloadIT: Smart Grids in the municipality of Zaanstad



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iNRG | Energizing People

COMPANY

The smart energy solutions of iNRG are based on a strong philosophy of 'the customer in control'. iNRG enables its customers to gain insight into their energy consumption, thereby creating awareness, control and a robust foundation for future smart-grid solutions. Today's consumers are becoming increasingly aware of the importance to stay in control. Therefore a trusted, open and flexible Energy Management System (EMS) is required to bring consumers and businesses together, ensuring cost and resource efficiency, thus providing a sustainable environment for generations to come. With the EMS of iNRG, consumers stay in full control of their energy information. Additionally, iNRG assists end users in efficiently generating, using or distributing their own energy in cooperation with suppliers and installation/service contractors.

PRODUCTS

The open and flexible EMS of iNRG is installed in the customers' meter box. The independent intelligent software enables

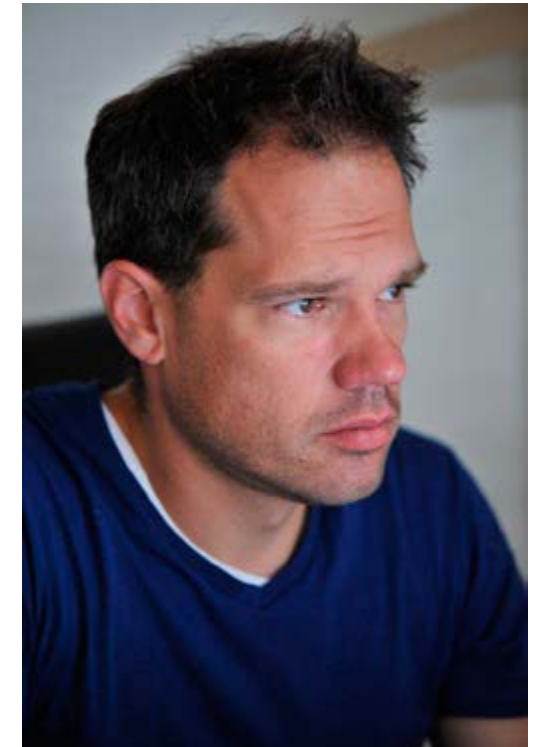
transparency and control of energy usage and production. The data is truly owned by the user; there is no need for a subscription nor is the data hosted externally. Additionally, third parties can create new applications for the EMS by using its open API interface.

NETWORKS

Co-creation is an important part of the iNRG philosophy: iNRG collaborates with energy cooperations, universities, students, device manufacturers and service providers, and is continuously exploring new co-creation possibilities.

PROJECTS

iNRG is currently involved in twelve local, national and European projects. In these projects, it fulfils various functions, from project leader and spearhead to subcontractor. Moreover, iNRG initiates pilots, in-service surveys, and scientific as well as applied research.



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IPSUM

COMPANY

Founded in 2011 on the firm belief that saving energy should be easy and hassle free. IPSUM empowers customers to take control of their energy consumption based on real-time, accurate insights, in a positive, smart and non-intrusive way. We guide customers along their journey to save energy. We do this by connecting technology, information and people in an intelligent and creative way. A bit rebellious, but always with respect and a strong social believe.

WHAT WE DO

Sustainable energy savings are possible if people understand the details of their energy consumption. Ipsum shows its customers, continuously and in real-time, the Why? What? When? and How Much? of their energy consumption, at a very granular level (per appliance).

Ipsum can help make savings sustainable via targeted and focused feedback. We will tell customers what to do and when in order to capture savings opportunities, and we will continuously keep them informed of the

result of their actions via our feedback loop.

- IPSUM provides Coded Power, a unique algorithm-based service for energy consumption insights and awareness
- Data generation via one measuring unit in the meter cabinet (non-intrusive, easy to install)
- Detailed & dis-aggregated footprint of the energy consumption (per individual appliance, from LED light bulb to HVAC and anything in between)
- Ipsum OS finally makes the 'not so smart' Smart Meter smart and useful

OUR SERVICE

- Insight & Awareness (B2B and B2C): know all the details of your energy consumption
- Behavioural Change (B2B only): knowing the details and understanding how to save energy structurally & sustainably

PROJECTS

- MOBEG, winner of the Dutch Smart Grid 2013 Award: Monitoring & Control of buildings using disaggregation algorithms
- CENTRAL HOUSE, UCL, London, complete disaggregation as the basis for behavioural change



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Locamation

COMPANY

Locamation offers substation automation solutions for High Voltage, Medium Voltage and Low Voltage power markets.

The company's SASensor product range represents an affordable, reliable and sustainable open platform architecture to protect, monitor and control power distribution at substation level.

Locamation was founded 30 years ago as a specialist developer of industrial control and real-time software. Many of these solutions are still in use today. In the early 1990s, the company focused its attention towards the power transmission and distribution market. Today it successfully provides products, solutions and services to power distribution networks in several countries including the UK, Sweden, China and the Netherlands.

PRODUCTS

- SASensor MyBox & SASensor My Grid offer flexible and scalable primary, secondary and low-to medium voltage substation digitisation and automation solutions. An

open software platform, SASensor provides flexible yet powerful network management, metering, control and protection solutions that guarantee efficient grid operations and smart grid planning.

NETWORKS

Dutch Power, CIGRE, SETS, TEG

PROJECTS

- Fortum: The SASensor open Application Suite is currently being rolled-out at Fortum's Kyrkviken 70/10kV substation in Stockholm, Sweden. The Fortum solution was further enhanced with a 3rd Party protection function developed by one of our technology partners Protrol.
- SSE/ PNDC: As a tier two member of the Power Network Distribution Centre in Strathclyde, Locamation has established a permanent demonstration and test site for new substation automation algorithms within the centre's unique 11kV/LV network. Here we assist with the definition and execution of research, development and



demonstration projects that will shape the electricity industry of the future.

- China: Locamation recently joined forces with Beijing Shuangdian Electric in China, to assist in market growth of SASensor products in the Chinese market. Our first installation has been shipped and commissioned.
- S.A Liander: Roll out of substation automation in all 400 primary substations of Dutch power retailer Alliander.
- Smart Cable Guard: A joint project with Enexis, Alliander and KEMA, where we provide technology for on-line measurement of partial discharges in cables.
- Lochem energie: Smart Grid integration in the city of Lochem. Enabling the technology to balance 1000 prosumers supplying photo voltaic energy, introducing a new concept for integrating electrical vehicles in the net and providing an integrated solution from prosumers to Network operators.

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Mastervolt

COMPANY

Founded in 1991, Mastervolt is a world leader in the development and business-to-business supply of electrical power solutions. With its head office in Amsterdam (the Netherlands) and several branches worldwide, Mastervolt sells these solutions in more than sixty countries throughout the world via a network of distributors and dealers.

With its products and systems, Mastervolt offers the customer the 'power to be independent'. In order to guarantee that independence, Mastervolt has always opted for quality and the power of innovation; this has led to Mastervolt becoming a leading worldwide A-brand with a clear focus and specialisation in three market sectors. For these market sectors, Mastervolt provides high quality electro-technical systems for independent energy supply:

- Maritime energy
- Automotive energy
- Solar energy

PRODUCTS

- Autonomous electrical power systems with conditional grid connection (micro-grids)
- Lithium-ion and Lead Acid battery storage technology
- Grid-connected PV inverters
- Residential PV Storage systems

NETWORKS

EMVT, association for innovation in electro-technical products, processes, and applications: www.emvt.nl

NETWORKS

- TKi Switch 2 Smart Grids: PV-Sims
- TKi Solar Energy: MLPM
- EU FP7-Energy: INCREASE
- EU FP7-Energy: City-Zen

NETWORKS

EMVT, Amsterdam Smart City



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Nedap Energy Systems

COMPANY

The Nederlandsche Apparatenfabriek or 'Nedap' (www.nedap.com) was formed in 1929 and currently has more than 750 employees worldwide. Nedap is a manufacturer of products that offer an intelligent technological solution to relevant issues, such as smart networks for sustainable energy, clean drinking water and sustainable nutrition.

The focus is not on the technology itself, but on the way in which it is used. Nedap's solutions distinguish themselves by converting new technologies into elegant and user-friendly products in a creative and innovative manner.

PRODUCTS

The PowerRouter of Nedap Energy Systems, introduced in 2009, is a fully integrated energy management system for use at home. With this system, everyone can build their own network for sustainable energy, to which solar panels and batteries can be connected. The energy generated can be used directly or stored in batteries for later use or fed back

into the grid. Multiple PowerRouters can be combined to build a smart grid or virtual power plant.

NETWORKS

- Bundesverband Solarwirtschaft BSW; www.solarwirtschaft.de
- FZI Forschungszentrum Informatik; www.fzi.de
- Forum Netztechnik/Netzbetrieb im VDE (FNN); www.vde.com/de/fnn

PROJECTS

- Mijnstuurkje.nl (under development with Alliander)
- Future energy system Powermatching City 2



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Phase to Phase BV

COMPANY

Phase to Phase develops software for calculation on electricity grids. It combines current knowledge of mathematics, physics and ICT to create programmes, that our users find to be both accessible and practical. Among Phase to Phase's clients are grid operators, industry, engineering firms, polytechnic schools and universities.

PRODUCTS

The software products in the Vision Power range offer solutions for everything concerning electric network analysis: load flow, short-circuit currents, fault analysis, protection analysis, reliability evaluation, cable optimisation, protective earthing and voltage optimisation. The clear software structure makes these equally suitable for both frequent and occasional users. The software products are used at all levels of the power system, from high voltage transmission to low voltage distribution, and in all types of industry. Fast three-dimensional presentation of power networks in a geographical plane facilitates a better

understanding of the network, based on aerial photos and maps, down to street level. The software also supports network presentation in panoramic street views. The PQ application gives a clear interpretation of the measurements by presenting them using a uniform classification system. This application supports voltage variations, voltage dips, frequency variations, harmonic distortion and unbalance.

NETWORKS

- Dutch Power: www.dutchpower.net
- Watt Connects: www.wattconnects.nl

PROJECTS

Due to the emergence of, for example, distributed generation, solar panels and electric vehicles, present day distribution grids increasingly face two-way traffic. Therefore individual consumers become involved in the grid. In order to provide them with insight concerning the possibilities and limitations of the grid, Phase to Phase developed Vision World of Energy: a portable virtual distribution network that instantly

makes clear what happens when too many neighbours buy electric cars or solar panels and what a neighbourhood can do to maintain supply of the grid.



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Plugwise

COMPANY

Plugwise designs, develops, and produces wireless energy management and control systems providing individuals and organizations with a true understanding of their energy use. Reliable insight into and control of energy consumption enables large financial savings. The company conducted successful pilots with Alliander, Enexis, Essent and others.

PRODUCTS

A basic Plugwise package consists of 2, 5, or 9 smart electricity meters and switches which form a wireless network, based on ZigBee technology.

Using the software, the modules ('Circles') communicate energy use for each appliance connected and automatically switch appliances using smart time circuit diagrams or with additional, wireless motion and heat sensors.

Plugwise also offers convenient solutions for insight into energy production (solar panels), metering and sub metering, and reading smartmeters – for companies as well as

individuals. Historical and current use can also be viewed through the extended, protected web portal, through the Plugwise app for smartphones and tablets as well as the standard software.

Recently Plugwise launched its Inventory Tool which enables detailed building inventory for installers and resellers, by using an innovative app on their tablet. Furthermore, Plugwise extended its solar app by providing information on the performance of a client's solar panels but also the expected return on investment.

PROJECTS

- **Alliander Exclusive Staff Project:** Alliander staff members took part in a special project to get acquainted with the new smart meter. Combined with the Plugwise Energy Management system participants received a detailed view of their energy consumption on their smartphone / tablet.
- **Oskomera Solar & the Dutch consumers' association Vereniging Eigen Huis (VEH):** members of the VEH took part in the collective purchase of solar panels, and

together with the Plugwise Stretch 2.0, Solar participants received a detailed view of the performance of their new solar panels.



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PR-Electronics (PRE)

COMPANY

Experts in Power Electronics and product development. We provide engineering services for the industry, mainly OEM companies.

PORTFOLIO

Chargers, Inverters, grid connecting devices, bi-directional converters.

Range: 0 W to 1 MW

References: The most successful DC Fast-charger on the market.

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Prysmian

COMPANY

Prysmian Group is the world leader in the Industry of high-Technology Cables for Energy and Telecommunications. The Group operates with two respected global brands: Draka and Prysmian.

Through these two brands we offer cabling for High, Medium and Low Voltage Energy networks and copper and optic fibre telecom cabling for application fields like Utility, Telecom, Premise, Office, and Industry. Prysmian Group is a company listed on the Milan Stock Exchange, with an aggregated history of 130 years, it employs 22,000 people in 50 countries and has more than 90 factories around the globe.

PRODUCTS

Throughout all of the business lines within the Prysmian Group, sustainability and CSR are priority issues. As a global leader, Prysmian Group has taken a front-runner position, disclosing its merits in the annual “Sustainability Report 2013” – downloadable here.

The convergence of Energy and Telecom – our main business lines – is imminent in Smart Grids. Our Prysmian HV, MV and LV cables are the backbone of the Tennet, Alliander, Enexis, Stedin and Delta networks where availability of the grid is essential for a future-proof network. We work together with our customers to achieve this by reinforcing the existing grid and by supporting and optimising the reliability of the grid. Prysmian Group offers customers one-stop-shopping for products, systems, expertise and innovative capabilities.

We also supply cable, additional products (e.g. accessories) and services (e.g. engineering, installation and diagnostics) to green energy parks, such as Wind Parcs, Solar PV power plants and power outlets for electric cars. In all cases, we can help our customer achieve the highest performance in sustainability.

Prysmian Group can provide product knowledge and innovation, plus benchmarking through worldwide best practice and solution concepts.



NETWORKS

- Fiber-to-the-Home Council Europe
- EuropaCable
- Dutch Power association
- CIGRE, CIRED, IEC, CENELEC and NEC
- Participating in “Friends of the Supergrid” and “Medgrid” organizations

PROJECTS

- Smart offices
- Industry (Schiphol Airport – The Grounds)
- All Electric (residential area Hoog Dalem)

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Renault

COMPANY

Renault belongs to one of the leading manufacturers of electric vehicles. Renault was the first brand to introduce a full range of electric vehicles, with a clear focus, sustainable mobility for everybody. Therefore the range exists of vehicles belonging to the segments with the largest market shares, such as the compact segment, but also light commercial vehicles. Electric vehicles allow a manufacturer to be more involved in the total chain related to electric mobility. From this point of view Renault has great interest to see how certain projects can be of interest for our future customers, and it allows Renault to contribute with an extensive experience in electric mobility.

PRODUCTS

Renault has a range that includes four full electric vehicles, all positioned in different market segments. Products such as light electric vehicles for urban purposes, like the Twizy, the revolutionary and patented ZOE, and light commercial vehicles like the Kangoo Z.E.

NETWORKS

Renault provides a wide and international network, thanks to participations in several EU projects and its extensive automotive heritage and experience.

PROJECTS

- Smart Grid in Balans (Smart Grid in Balance)
- Green e-Motion
- Mobi-europe
- E-Dash
- Elvire
- Ecocharge

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Schleifenbauer Products BV

COMPANY

Schleifenbauer Products produces intelligent current and energy meters for data centres. Data centres are very intensive energy users for whom the energy costs can amount up to 75% of the operating costs. The Power Distribution Units (PDUs) of Schleifenbauer enable users to obtain detailed insight (down to the server level) into the energy consumption. This information enables them to increase the efficiency of energy consumption and to charge the costs on to the consumers.

PRODUCTS

Schleifenbauer supplies PDUs for installation in server cabinets. These are able to measure not only the total current in the PDU (16A, 32A, and 63A single phase and three-phase), but also on every individual port of the PDU (up to a maximum of 45 ports per PDU). In addition, Schleifenbauer provides the DP Meter. A single DP meter can perform measurements on 27 feeder groups. Schleifenbauer also has a meter that can be installed in junction boxes of bus-bar systems

(BB Meter). Schleifenbauer's meters measure current (I), voltage (V), power factor (%), apparent power (VA), active power (W), and energy (kWh). The Schleifenbauer products are made exclusively to the specifications of the client. The entire R&D, production and assembly takes place in the Netherlands. Many European co-location data centres make use of Schleifenbauer measuring equipment.

The Schleifenbauer products communicate with a data bus using standard patch cables. Contact with other networks and protocols on a TCP/IP basis is possible via the Gateway.

NETWORKS

FHI, ECO (Germany), Code of Conduct on Data Centres Energy Efficiency, Groene ICT

PROJECTS

- Teletygroup, XS4ALL, BIT, BT, EUnetworks, R-iX, Parkpost, Leaseweb, Evoswitch, AMS-IX, DE-CIX, Interoute, InterXion.
- Various financial institutions, hospitals, and government agencies



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Siemens Nederland NV

COMPANY

For more than 165 years, the name Siemens has been synonymous with internationality and worldwide presence. Today, Siemens is active in around 190 regions, occupying leading market and technology positions worldwide with its business activities in the Energy, Healthcare, Industry, and Infrastructure & Cities Sectors. Overall, with 370,000 employees (continuing operations) around the world, Siemens is well positioned to offer its customers local, targeted and tailored solutions.

In the Netherlands, Siemens has been active since 1879. With sales of over €1.5 billion and some 3000 employees, the Siemens Group is one of the largest electrical engineering and electronics companies in the Netherlands.

PRODUCTS

Siemens Smart Grid provides a complete end-to-end spectrum of technologies, products, service and solutions to develop intelligent energy networks. Siemens works closely with energy producers, grid operators, industrial companies, multi-utilities and

cities to help them meet the challenges of a new area.

Siemens Smart Grid incorporates the industry's most innovative IT solutions to optimize information and communication. The more intelligent these systems are, the more useful and valuable the information generated from field data becomes. Incorporating digital sensing and automated analytics across the entire energy system will revolutionize the industry.

Apart from the products and solutions for protection and automation of high- end medium voltage networks, SCADA systems, Meter Data Management systems, Siemens also offers Operation and Maintenance services, Network Consultancy and Training.

PROJECTS

- Self Healing Grid: project in cooperation with Stedin
- Smart Grid Compass: a study together with Delta Netwerkbetrijf into rolling out a Smart Grid in the Netherlands

- Implementation of Smart Meter Data Management System with Alliander
- Member of Smart Energy Collective: The Grounds Schiphol



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Smart Dutch

COMPANY

Smart Dutch is specialized in wireless communication technologies for the utility branch. It focusses on development, marketing, standardisation and consultancy. Three successful smart meter pilots in the Netherlands (at Stedin, Delta and Enexis) are used as the basis for European standardisation.

PRODUCTS

Smart Dutch communication modules are mostly based on 2,4 GHz (such as Wi-Fi) and sub GHz meshed RF technologies (868 MHz). Meshed RF is a wireless communication technology using large numbers of nodes to create a reliable and robust network. These networks ensure a continuous exchange of (real-time) data between devices and back office.

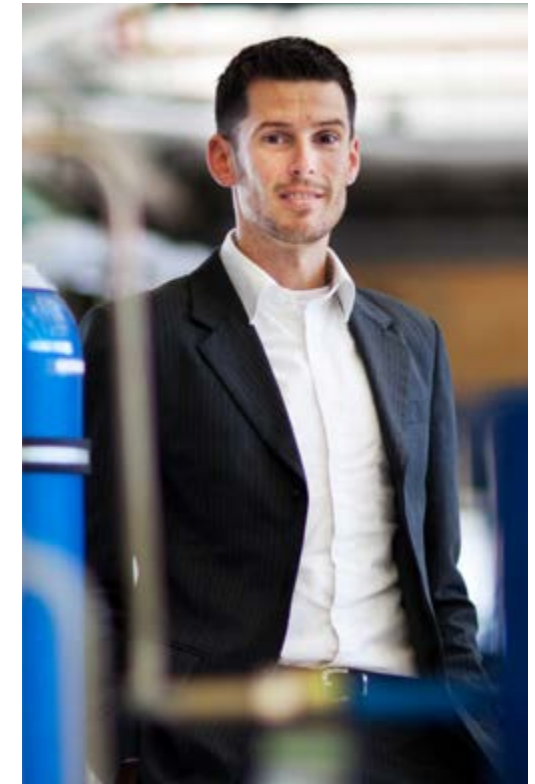
Meshed RF technology is very well suited for use in future-proof smart energy grids. For instance, it is possible to deliver meter reading/commands/rates not just once a day, but every fifteen minutes. This enables the

infrastructure to be used for real-time services, such as Real Time Pricing and Low Voltage Load Management. Pilots in existing neighbourhoods have revealed that this alternative smart meter technology is extremely reliable and fast.

In addition, Smart Dutch possesses product and market knowledge of smart energy meters in the Netherlands (such as NTA 8130+ and DSMR) and Europe, and knowledge of European standardisation channels and documents (such as CEN CENELEC, ETSI, CEPT/ECC, ESMIG, and M441 & M490).

PROJECTS

- EOS Short-Term Research grant (KTO-subsidy, April 2010 – October 2012)
- Smart Energy Collective:
www.smartenergycollective.nl



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TKF

COMPANY

Founded in 1930, TKF has developed from a local Dutch cable producer to a cable technology leader servicing customers all over the world. As a member of TKH Group NV, a Netherlands based international group of technology-powered companies, TKF has access to various international marketing, purchasing sales and research groups with diverse specialities.

PRODUCTS

TKF has dedicated itself to delivering innovative Telecom, Building and Industrial Solutions that match specific customer needs. This is an effective strategy, when considering the long-term relationships between TKF and a growing number of companies: professionals who value the continuous pursuit of a better understanding between suppliers, customers, contractors, installers and end-users.

TKF produces cables and supplies innovative, high-quality cable solutions for the market segments Broadband, Energy, Marine & Offshore, Railinfra, Home, Utility, Industry

and Infra. Our strength lies in delivering a complete cable solutions portfolio of copper, aluminium and fibre optic cables and accessories for a wide range of applications.

- Medium and high voltage cables up to 150 kV
- Fibre optic cables and Components
- Data cables
- Low voltage distribution cables
- Transformer switch connection cables
- Low voltage installation cables

NETWORKS

- Dutch Power: www.dutchpower.net
- FME/CWM: www.fme.nl
- Dutch Energy Solutions: www.dutch-energysolutions.nl
- Nederlandse Wind Energie Associatie: www.nwea.nl

PROJECTS

- Maasvlakte 2, Rotterdam
- Connecting Windmills



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Wattcher BV

COMPANY

Wattcher is a product organization for development and marketing of energy monitoring displays, in-home energy systems and affiliated products. The mission of Wattcher is to increase the experience of energy. Experience that leads to involvement. Involvement that leads to energy savings and financial benefits for the users. Wattcher's strategy is to create products that are distinguished by design, durability and commitment towards our end users.

In developments Wattcher closely cooperates with utility companies, technology suppliers and market participants. For further information please contact info@wattcher.nl.

PRODUCTS

- Wattcher A1: design energy monitor to simply visualize the current energy consumption, daily consumption, average daily consumption and the realized savings in euros and in percentage. The Wattcher A1 in white, purple and yellow consists of a design energy display, a transmitter and an



- optical sensor, and works on analogue meters, pulse meters and smart meters (not reading P1 but pulse LED).
- Wattcher A1 smart meter: Wattcher A1 with extra functions and accessible to the smart meter.
- Wattcher DA1 datalogger: in-home energy hub that receives data from several sensors and makes it accessible to the end user via internet and mobile phone.

NETWORKS

- Technology partner in TKI Switch2SmartGrids

PROJECTS

- Cost neutral housing project in Zeist
- Energy neutral housing project in The Hague
- Awareness scheme for energy consumers in Austria
- Energy awareness schemes together with municipal organisations
- Consumption versus solar production awareness scheme
- Several energy monitoring schemes in NW-Europe

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Xemex NV

COMPANY

Xemex, founded in 1996 by Chris Matthys, is a provider of smart metering communication hubs. The company is a leading innovator in its industry and is currently market leader in the Netherlands with an installed base of over 500,000 data communication modules. Xemex's customers are utility companies, meter manufacturers and telecom operators in the Netherlands, Belgium, Germany, UK and the Nordics. Xemex develops multi utility telemetry communication modules based on open standards such as the Dutch DSMR 2.1, 3.0 and 4.0. Xemex provides its module for mainstream smart metering, but also provides niche market products such as data loggers for standalone gas and heat meters or solutions for end consumers to utilise the consumer ports on meters. Xemex has a large team of R&D specialists in the fields of DLMS, M-bus and Zigbee.

It also has vast experience in various IP based radio technologies such as GPRS, CDMA450, UMTS and Ethernet. Xemex' continuous innovation and years of experience assures

reliable cost optimised communication in the field towards the Utilities' assets.

PRODUCTS

- Smart meter gateways based on the Dutch Smart Metering Requirements, versions 2.2, 3.0 and 4.0.6, available with GPRS, UMTS, Ethernet and CDMA450 P3
- Standalone Gas gateways for exceptional situations and C&I
- Gross Production meters for solar panels and wireless m-Bus coupling
- Consumer P1 products for stimulation of smart meter acceptance

NETWORKS

- Involvement in DSMR standardisation
- Part of the DLMS association and M-Bus user group
- Part of the CDMA Development Group for CDMA450 promotion

PROJECTS

- Rollout of Stedin smart meters in the Netherlands

- Proof of Concept CDMA450 by Alliander
- Rollout of smart meters according to DSMR 4.0 for Netbeheer Nederland
- Various smart meter projects in Belgium and Germany
- Pilots with P1



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Alliander NV

COMPANY

Alliander is a grid company that transports electricity and gas. The company manages 40% of the Dutch regional grids and is responsible for the construction, maintenance, and updating of these electricity and gas grids. Alliander supports the deregulated energy market and encourages economic and social growth in the regions in which the company is active. All of Alliander's shares are owned by provinces and municipalities.

Alliander prepares the grids for new forms of energy generation, such as solar panels and wind turbines. Alliander is also devising solutions for charging electric vehicles. Sustainable energy should be affordable and reliable. Therefore, Alliander is developing high-quality technological innovations, which provide customers with better insight into their energy consumption. Alliander attaches great value to knowledge and research in the field of innovation and seeks to cooperate with other parties in order to achieve the best results.

PRODUCTS

As a grid company, Alliander has decades of experience in construction, maintenance, and operation of energy grids. The company fulfilled a pioneering role in the development of smart meters. At the moment, Alliander is implementing a broad programme for the digitalisation of existing grids. More on its innovations:

www.liander.nl/sc/Images/Overzicht_innovaties_duurzaamheid_Liander_2013_tcm300-255657.pdf

NETWORKS

- Active in Netbeheer Nederland (as chair of Smart Grids project group):
www.netbeheernederland.nl
- Co-founder of e-Decentraal foundation:
www.e-decentraal.com
- Participant in Smart Energy Collective:
www.smartenergycollective.com
- Global Intelligent Utility Network Coalition:
www.agentschapnl.nl/subsidies-regelingen/intelligente-netten/proeftuinen

PROJECTS

- Realisation of micro-grid (autonomous district) in Zutphen;
www.liander.nl/liander/innovatie_duurzaamheid/gelderland/stedendriehoek/een_vakantie_op_autonome_zonne-energie.htm
- SASensor technology development;
www.locamation.nl/solutions
- Within IPIN: SEC, Modienet, INZET, TexelEnergie, LochemEnergie;
www.agentschapnl.nl/programmas-regelingen/proeftuinen-intelligente-netten



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Alstom Grid Nederland

COMPANY

Alstom is a global leader in the world of power transmission and sets the benchmark for innovative and environmentally friendly technologies. Alstom manufactures engineered solutions for electrical grid applications in utility and industrial settings and provides integrated and customised turnkey solutions such as alternating current and direct current substations, from medium voltage to ultra-high voltage. Alstom's solutions enable the efficient transmission of electricity and support the development of Smart Grids and Super Grids. Today's electrical networks are evolving into Smart Grids, intelligent electrical networks with two-way energy flow and the supply of real-time information between power generation, grid operator and consumer. This innovative technology allows for enhanced integration of renewable energy and more efficient electrical transmission across the entire energy grid. Alstom Grid is at the heart of this Smart Grid revolution, with solutions combining its key technologies to provide immediate benefits to energy producers, the

utility sector, industries and end-users.

Alstom Grid has one clear vision: to develop innovative solutions for a flexible, reliable, affordable and sustainable electrical grid, everywhere. We design, manufacture, install and service the power transmission and distribution products and systems that empower the planet's low carbon economy... for now and for the future.

Alstom Grid has over 130 years' experience and ranks among the top three in the electrical transmission sector, with an annual sales turnover of € 3.8 billion. Alstom Grid's 17,000 employees are spread across 87 manufacturing and engineering sites worldwide and have one common mission: to be our customers' trusted partner, from the source to the city. We are energising a smarter world... with Alstom.

PRODUCTS

- High Voltage Products
- Substation Automation Solutions
- Network Management Solutions

SERVICES

Find more on our website
<http://www.alstom.com/grid/>

NETWORKS

ALSTOM Grid is a member of Dutch Power, and an active member of Cigre and Cired.



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Cogas

COMPANY

Cogas has been the independent distribution service provider in the Eastern part of the Netherlands (Twente) for more than 45 years. 135,000 households are provided with natural gas and / or electricity through our distribution infrastructure, and 80,000 residential and commercial customers have access to radio, television, internet and telecommunications through our fibre optic infrastructure.

The coming years our business environment will change dramatically. Distribution infrastructure will become more heavily loaded by an increasingly energy intensive society, end-users will generate their own energy and traditional energy resources will become scarcer. In this new world we want to play an appropriate role as distribution service provider.

We aim to contribute to a sustainable Twente where our customers can live, work and enjoy life comfortably, by bringing together and collaborating with relevant stakeholders.

We focus on three specialisations to fulfil our role to the best extent possible:

1. Connections – construction, maintenance and operation of reliable (smart) distribution infrastructure.
2. Energy management – creating and applying tools to provide better insight and advice for more efficient energy consumption.
3. Renewable energy – stimulating distributed renewable energy solutions for a sustainable energy supply.

NETWORKS

- Netbeheer Nederland
www.netbeheernederland.nl
- Smart City Collective
www.smartcitycollective.com
- Het Groene Oosten
www.hetgroeneoosten.nl

PROJECTS

- Actieplan Duurzame Energievoorziening
<http://www.netbeheernederland.nl/nieuws/nieuwsbericht/?newsitemid=198148098>

- Smart Grid Evolution (preparation for a large scale smart grid project with 500k connections)
- Green Deal Smart Energy Cities (100k sustainable houses)
- SAFIRE (building an integral test facility for smart grids)



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Delta Netwerkgroep

COMPANY

Delta Netwerkgroep (DNWG) is the regional grid operator for electricity and gas in the province of Zeeland. DNWG offers unrestricted, uninterrupted and non-discriminatory access to the energy market, both in energy transmission and data. DNWG is responsible for the construction, maintenance, and development of these grids. It takes care of updating and modifying existing connections and makes available meters, transformers, and gas pressure control stations. DNWG is continuously investigating new methods and techniques within this service. This knowledge is also used to enable the transition to sustainable energy solutions.

In addition, it is the task of DNWG to facilitate the deregulated market. For that purpose, the company has created a number of systems and registers, such as for switching, allocation, and customer information. In close consultation with the other grid operators in the Netherlands, DNWG is active in the Netbeheer Nederland trade association and in the NEDU association.

PRODUCTS

DNWG is continuously working on updating the grid in order to apply the latest technologies more effectively and efficiently. DNWG uses and offers its knowledge, expertise, and data to support stakeholders and supply-chain partners in attaining their sustainability objectives. In that respect, Smart Grids offer interesting perspectives.

NETWORKS

- Netbeheer Nederland (Grid operators trade association)
- Smart Energy Collective

PROJECTS

- Tholen net optimisation pilot: installing remote switching and advanced metering equipment in the electricity grid for optimisation of availability, reliability and capacity.
- Goes-West Smart Energy: managing energy surity and affordability via smart energy solutions, e.g. smart transformer and IHEMS.
- Walcheren gas grid monitoring: pressure

and flow control of the gas distribution grid for asset management and grid control purposes, increasing utilisation and reliability.



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ECW

COMPANY

Energie Combinatie Wieringermeer (ECW) is the private utility company for the Greenhouse and business area A7 Agriport. ECW owns the networks for the transport of Gas, Power, Heat, CO₂, water and data (glass fibre) to and from Greenhouses and Data Centres.

ECW's objective is to provide energy in the area, in the most sustainable and flexible manner possible. We therefore specialise in facilitating companies that use and supply energy. We integrate all services with our web-based smart grid system, called EWEB. We herewith give users the chance to trade their contract values and also protect our system from overload, at the same time. Besides transportation of energy, ECW also produces roughly 30 MW of geothermal heat since 2014. This makes ECW a leading player in the Dutch geothermal sector.



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Enexis BV

COMPANY

Enexis manages energy grids in seven provinces in the north, east, and south of the Netherlands. The company is responsible for approximately 2 million safe gas and 2.6 million electricity connections for households, businesses, and authorities. Enexis is continuously working on a better, smarter and more efficient grid that is ready for the future. Consequently, the Enexis energy grid is also one of the best in the Netherlands. Enexis is anticipating large-scale investments in the future, when the energy transition will be facilitated regularly and traditionally. In order to be ready for the future, Enexis is investing in acquiring knowledge and practical experience. For that purpose, Enexis is operating several large-scale demonstration projects focused on the interaction with the user of the grid.

NETWORKS

- Netbeheer Nederland (as member of the Smart Grids Project Group)

PROJECTS

- Smart grid with the consumer in Zwolle and Breda
<http://jouwenergiemoment.nl/>
- Green Gas projects
<http://www.enexisinnovatie.nl/themas/duurzaam-gas/>
- ElaadNL
<http://www.elaad.nl/>
- Children being introduced to the energy of

today and tomorrow

<https://www.vanzonkrijgjeenergie.nl/>

- Putting smart charging into practice
<http://www.smartcharging.nl/en/>

More information of these and other smart grid pilots on:

<https://www.enexis.nl/over-enexis/slim-energienet?src=ohp>



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Stedin Netbeheer BV

COMPANY

Stedin is a grid operator for gas and electricity. Its supply territory is mainly located in the (Randstad) conurbation: in the provinces of Zuid-Holland and Utrecht. Here, Stedin serves almost two million private, business and government clients. In addition, as a grid operator, Stedin is responsible for the construction, expansion and maintenance of the transmission grid. The grid territory of Stedin also offers smart grid possibilities: in the urban environment and services sector as well as in large-scale industry and the port of Rotterdam.

PRODUCTS

Stedin recognises the importance of smart grid solutions and strives to actively facilitate sustainable applications. It does this by creating pilot projects for smart grids, which include controllable demand, sustainable generation, and sustainable applications, among other things. Stedin also tests modern technologies on the grids at various locations for the purpose of reducing the risk of failures and if failures do occur, reducing the recovery time.

NETWORKS

- Netbeheer Nederland
- Utrecht Sustainability Institute
- Smart Energy Collective
- USEF (Universal Smart Energy Framework)
- FAN (Flexible Power Alliance Network)

PROJECTS

- Participation in IPIN pilot projects:
 - Couperus
 - Hoog Dalem (Smart Energy Collective)
 - Heijplaat
- Smart Grid, rendement voor iedereen



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Westland Infra

COMPANY

Westland Infra manages the technically high-quality energy networks which constitute the 'roots' of Westland. It is for good reason that this region is widely known outside the Netherlands as the 'garden of Europe'. As an infrastructure company, as well as a company that provides measuring equipment, Westland Infra has a widespread network throughout the Netherlands, including a range of products and services geared to providing excellent support for companies. These include installation and management of infrastructures, usage measurements, monitoring, know-how for efficient energy consumption and smart grid solutions.

PRODUCTS

Westland Infra develops and delivers total solutions for managing smart networks. These balance the demand and supply of electricity, gas and/or heat at a local level. The client's requirement predominates in this. Westland Infra converts private networks into smart grids under the name E-web. The

connected clients provide balance in the network through mutual energy deals. Westland Infra developed the E-web ICT system for maintaining energy deals and for exchanges with nationwide networks. The system also monitors the physical load on the network and prevents overloading. It has been designed as fail-safe. This prevents loss of connectivity caused by possible disruptions. The results of E-web are very promising. As a result of the maximum employment of cogeneration and fewer transmission losses, CO2 emissions are being reduced. The local optimisation of demand and supply ensures less energy purchase from the national networks. Consequently, the payback period is very short. E-web is perfect for optimum utilisation of (sustainable) energy sources which involve variable production. It is also the best solution for hot water systems, which demand that the heat source operates for as long a period as possible. E-Web Geo shows optimisations of the earth's thermal energy with higher return on investments.

NETWORKS

- Newenergy Green

PROJECTS

- Congestion management in the Westland region (December 2008 – May 2010)
- E-web: commercial smart grid solution for private network
- E-web Geo: optimisation of thermal energy for more profit and smart and safe heat exchange



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Accenture BV

COMPANY

Accenture is at the forefront of the evolution to a smarter grid. From generation to in-home energy management, from strategic blueprints to operational data analytics, and from the boardroom to the operations centre. Accenture provides the experience and skills, global resources, proven methodologies and industry-leading technology assets utilities needed to realise the vision of a more intelligent grid.

Accenture is globally involved in key Smart Grid projects. In the business domain of Accenture Smart Grid services we focus on delivering innovative business solutions supporting the modernisation of electric, gas and water network infrastructures to improve capital efficiency and effectiveness, increase crew safety and productivity, optimise the operations of the grid and achieve the full value from AMI data and capabilities. It includes four offering areas which cover consulting, technology and managed solutions: Work, Field Resource Management, Transmission & Distribution

Asset Management, Advanced Metering Infrastructure (AMI), and Grid Operations.

NETWORKS

- Amsterdam Smart City
- GridWise Alliance
- Smart Grid Consumer Collaborative
- World Economic Forum – Project Advisory Company
- Eurelectric
- IEEE

PROJECTS

Accenture is globally active in projects developing capabilities in the areas of EAM, IOT, (Cyber) Security, Asset Management (e.g. PAS55), Condition Management, Analytics, Smart Metering, Telecom.



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Atos

COMPANY

Atos is an international IT-service provider with an annual turnover of 8.7 billion euros and 74,000 staff across 42 countries.

Worldwide Atos provides high-tech transaction services, advice and technology, system integration, and management services. Atos offers business technology which helps clients, and enables them to create their enterprise of the future. Atos is the global IT partner for the Olympic Games, and is quoted on the Paris Eurolist Market. Atos operates under the names of Atos, Atos Consulting and Technology Services, Atos Worldline, and Atos Worldgrid.

PRODUCTS

Energy suppliers are seeing an unprecedented, permanent change in their dealings with clients with direct effect on production, transport, storage, and delivery of energy or water. Atos Worldgrid provides turnkey solutions to optimise a company's critical processes. These support management on the demand side, optimise transport and distribution networks (with a

reduction in costs as a result), and provide real-time control of assets. All software, hardware, network and communication elements are brought together for maximum optimisation within the entire value chain in electricity, gas, oil, as well as water. For the optimisation of processes and achievements Atos Worldgrid realises the (international) integration of individual systems, such as smart meter management, invoicing, communication, maintenance, geolocation, and CRM. At Atos, more than a thousand Utilities consultants provide clients with state-of-the-art business and IT solutions. Many of them are expert in their profession and regularly publish vision statements, white papers, and articles.

NETWORKS

- Green IT Amsterdam
www.greenitamsterdam.nl
- ICT Road Map
www.nederlandict.nl/Files/TER/Routekaart_ICT_2030.pdf
- ACQUEAU
www.acqueau.eu

PROJECTS

- Smart Meters-roll-out for ErDF
- BigData for Energy
- Utility Grid

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nl.atos.net/worldgrid

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Capgemini

COMPANY

With more than 125,000 people in 44 countries, Capgemini is one of the world's foremost providers of consulting, technology and outsourcing services. The Group reported 2012 global revenues of EUR 10.3 billion. Together with its clients, Capgemini creates and delivers business and technology solutions that fit their needs and drive the results they want.

A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model. Capgemini's Global Utilities Sector serves the top Utilities worldwide and draws on a network of more than 8,400 dedicated sector consultants.

As a leader in smart grid and advanced metering infrastructure solutions, Capgemini's Smart Energy Services is helping Utility customers throughout the world. Our integrated Digital Utilities Transformation

framework empowers utilities to drastically improve their customer experience, operating and business models through disruptive technologies.

PROJECTS

More on industry specific solutions is available at www.capgemini.com/utilities.



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CE Delft BV

COMPANY

CE Delft has been in existence since 1978. The company is a not-for-profit organisation. All shares are held by a foundation with the same name.

CE Delft is primarily involved in government policy (domestic and international) to realise sustainable energy options and it performs sustainability analyses of products throughout the entire chain. CE Delft's expertise resides in knowledge of policy, technology, economy, the behaviour of energy users, and chain analyses in the sphere of energy supply, transport, and raw materials. As an independent party, CE Delft not only performs projects for authorities, but also for energy companies and civil society organisations.

SERVICES

- Policy analyses of regulation relevant for encouragement or removing obstacles for smart grids
- Social cost-benefit analyses
- (Technical) analysis of the interaction between local production and

- consumption (electricity, gas, heat)
- (Technical) analysis of industrial energy users
- Energy analyses of SMEs
- Advices for incentives for energy users (consumers, SMEs) to change their behaviour

PROJECTS

- Social cost-benefit analysis of smart grids – Ministry of Economic Affairs (2012)
- Grid for the Future – vision written for grid operators in the Netherlands (2010)
- Energy-saving behaviour – Algemene Energie Raad (AER) (2006)
- Behavioural climate change mitigation options – DG Clima (2011/12)



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CGI

COMPANY

At CGI, we're committed to helping all of our stakeholders succeed. Our 68,000 professionals in 40 countries across the Americas, Europe and Asia Pacific provide end-to-end IT and business process services that facilitate the ongoing evolution of our clients' businesses. The largest (utility) companies are among our clients. CGI has a proven track record in smart grids. It provides ICT solutions and consultancy services and develops solutions, including one for electric transport.

PRODUCTS

For network operators, CGI is able to construct the business case for a smart grid investment. CGI designs and also delivers solutions which can integrate smart grids with existing (business) systems. For energy suppliers especially, an effective smart grid creates the physical infrastructure for dynamic and competitive retail markets.

NETWORKS

www.jouwenergiemoment.nl

PROJECTS

CGI is the partner par excellence in the development of the globally pre-eminent InovGrid project in Portugal. This project automates network management, improves service quality, reduces operational costs, promotes energy efficiency and increases the use of sustainable energy and electric transport. In the Netherlands, CGI holds a prominent position in the field of (ICT) solutions which makes it possible to charge electric cars. We support several international clients in terms of rolling out charging points for EVs. Finally we are taking part in a couple of smart grids pilots in The Netherlands. Approx. 400 households can monitor and manage their energy consumption, thanks to CGI's Central Energy Management Solution. The pilot will answer the question of whether utilities companies can influence flexibility in energy consumption.



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Cofely Smart Grid Solutions

COMPANY

Cofely is the European market leader in the field of sustainable technological solutions for energy and the environment. The company designs and implements solutions with which companies and public sector organisations can optimise systems performance and energy consumption in operating processes, and minimise the environmental impact. Cofely offers a unique combination of expertise in various domains. These range from design, installation and management of local and renewable energy solutions to the delivery of integrated facilities and services. Cofely is the most important brand of GDF SUEZ Energy Services, one of the six business units of GDF SUEZ. With the formation of Cofely Smart Grid Solutions, Cofely is anticipating new trends in the energy market. Its most important ambition is to create a more efficient, more environment friendly, and less expensive energy grid. Cofely has all expertise required for the design, construction, maintenance, and management of smart grids. We have experts for each phase of the process: from advice and design to realisation and multiyear

maintenance. Cofely's added value consists of practical knowledge about energy flows at the clients ('behind the connection') and the flexibility that can be found therein.

PRODUCTS

- Practical advice
- Project management, engineering, execution, start up, and maintenance
- System integration
- Insight in decentralised generation and consumption profiles
- Automation solutions for energy management and load control
- Strategic asset management

NETWORKS

- Dutch Power
- e-Decentraal
- NWEA
- Large company network (Grote Bedrijven Netwerk, GBN) of MVO Nederland

PROJECTS

- Ecofactorij Apeldoorn
- Windnet Oost-Flevoland
- Windnet Tholen
- Mahler IV Amsterdam
- A1 Deventer industrial park (IPIN pilot)
- De Koempel / Industrial park Heerlen (TKI Switch2SmartGrids)



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D-Cision BV

COMPANY

Consulting firm D-Cision was formed in 2007 and specialises in issues concerning energy supply: gas, electricity and heat. Thanks to its technical, economic and legal expertise, D-Cision offers an integrated approach to the development of smart grid projects.

SERVICES

D-Cision provides diverse consulting services to energy companies, grid operators, supervisory bodies, and national and local authorities. It provides technical, economic, and policy advice, such as on the development of a policy or strategy document or decision support in the context of policy or strategy development. In addition, D-Cision provides support for the development and assessment of specific project plans, as far as technical structure, the underlying business case, regulatory embedding, and the related risks are concerned. D-Cision has specific knowledge and experience in the area of smart grids and the integration of sustainable energy into the energy system. Terms such as strategy development, investment appraisal,

laws and rules/regulations, grid development, asset management, and process support are crucial in the advices.

NETWORKS

D-Cision maintains contacts with various high-level consultancy companies as well as university research groups.

PROJECTS

- Support for the Intelligent Grids Taskforce in the preparation of the vision document on smart grids commissioned by the Ministry of Economic Affairs (2010).
- Support for Netbeheer Nederland in the preparation of the Roadmap Smart Grids (2010).
- Ministry of Economic Affairs: 'Promoting the use of regional and local energy grids' (in collaboration with TNO, 2011) and 'The tariff structure for the electricity grid' (in collaboration with ECN and TU Delft, 2012).



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Deerns

COMPANY

Deerns is an international, independent technical consultancy and engineering firm. We help private and public organisations create a sustainable, comfortable and safe environment by providing feasible solutions, based on innovative designs. We design technical infrastructures for buildings, infrastructural facilities and urban and industrial areas. Our involvement starts from the very first conceptual stages and continues through detailed design, construction management, commissioning and after care.

Deerns plays a leading role as technical consultants and engineers. We offer a wide range of skills, knowledge and experience to our clients, combined with the enthusiasm of our highly dedicated, service-oriented, professional support staff. We maximise our added value, wherever relevant, in productive collaborations with service partners that match our ambitions and standards.

SERVICES

Deerns provides services in the conceptual development of smart grids. The development of energy visions for regions and their elaboration constitute activities in the sphere of smart grid development. In addition, Deerns is involved in the development of intelligent building systems and building systems that support the smart-grid system. Deerns designs and supports the realisation and takes care of monitoring.

PROJECTS

- Philips High-Tech Campus energy supply
- Duindorp Scheveningen – Seawater heating smart grid
- New Kabul, Afghanistan, energy-neutral
- Sustainable energy scenario, Groningen, 2005
- Roeterseiland, University of Amsterdam
- Intelligent heat network project TU Delft (ongoing)

NETWORKS

- Dutch Green Building Council
- Duurzaam gebouwd.nl



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DNV GL

COMPANY

At DNV GL we unite the strengths of DNV, KEMA, Garrad Hassan, and GL Renewables Certification. DNV GL operates in more than 100 countries with 3,000 energy experts who support customers around the globe in delivering a safe, reliable, efficient, and sustainable energy supply. We deliver world-renowned testing, certification and advisory services to the energy value chain including renewables and energy efficiency. Our expertise spans onshore and offshore wind power, solar, conventional generation, transmission and distribution, smart grids, and sustainable energy use, as well as energy markets and regulations. Our testing, certification and advisory services are delivered independently of one another, helping our customers make the world safer, smarter and greener.

PRODUCTS

DNV GL offers a comprehensive set of strategic and technical solutions for smart grids and the provision of energy in the future. DNV GL helps clients meet the challenges involved in the

creation of new values for their business by seamlessly blending smart grid technologies and renewable energy sources into their existing infrastructure to build profitable energy systems of the future.

DNV GL services include:

- Strategy planning, roadmap development and implementation planning
- Business case modelling and scenario planning
- Smart grid and smart metering consultancy services
- Innovation in smart energy products, services and solutions
- Standardisation of systems and protocol development
- Automation of distribution systems
- Protection of infrastructures and information systems
- Testing and certification of smart grid products and services

NETWORKS

DNV GL plays an important role in international and national organisations,



developing and standardising smart grids, a.o. USEF, SEC, SEDC, ESMIG, DER Labs.

PROJECTS

- PowerMatching City
- Flex Power Grid Lab
- DER Lab
- ADDRESS
- OPEN NODE
- OPEN METER

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EMforce

COMPANY

EMforce was established in 2002 and provides highly specialised engineering and consultancy services in connection with power electronics and related phenomena in electricity supply systems. Extensive experience with power converters for transport, industry and utility applications have made us the first consultancy firm to call when a converter system has to be specified or designed for an innovative application. We have successfully solved alignment or stability issues related to the integration of converter-based systems in power supply networks, or prevented these issues by preparing appropriate specifications, up to the highest power levels.

PRODUCTS

Customers normally hire us to produce designs or design specifications, to set up measurement programmes or to analyse measurement data. We have a track record of solving practical problems where others failed, or where the integration of different systems produced unexpected side effects.

We can even physically build our own designs. Our subsidiary EMPEQ has produced converters and control systems for a number of energy storage research projects with ratings up to several hundred kVA.

NETWORKS

EMforce's owner Frank van Overbeeke is a board member of the Dutch Association for advanced ElectroMagnetic Power Technology (EMVT). He is an active member of the National Study Committee of Cigré working group B4 on HVDC and Power Electronics. EMforce is a founding participant of the consultancy group EM Power Systems (www.empowersystems.nl).

PROJECTS

- EMforce participated in the EU FP7 project MORE MICROGRIDS.
- EMforce acted as the system architect of the Smart Storage project realised by Dutch network operator Enexis.
- EMPEQ supplied the DC / AC converters for both these projects.



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EnergyGO

COMPANY

EnergyGO is a young, dynamic and ambitious company that was founded by a number of former employees of the Energy research Centre of the Netherlands (ECN) in June 2011. For years they have researched and developed algorithms for energy-efficiency solutions for urban areas, buildings and energy grids. EnergyGO provides feasible, out of the box, no-nonsense and creative solutions. EnergyGO sells energy performance monitoring software and hardware.

PRODUCTS

EnergyGO offers five products and services ranging from a low-cost energy scan to full scale smart grid implementation:

- 'GO Scan' indicates the energy-saving potential in buildings, data centres, districts and organisations.
- 'GO Sense' is a data acquisition and logging solution to monitor energy flow and climate conditions.
- 'GO See' is a web portal, which analyses and visualises energy consumption, energy flow



- and performance of installations and buildings.
- The 'GO Value' methodology helps to explore and assess innovative business ideas for all involved stakeholders. The objective is for the business model to be profitable for each stakeholder.
- 'GO Match' is our Smart Grid software. Go Match can be used for simulation and implementation of energy demand and supply matching concepts based on dynamic prices, flexibility and availability. Go Match was implemented in the municipality of Zaanstad in the REloadIT project.

NETWORKS

- Consortium GreenIT Amsterdam
- Amsterdam Economic Board

PROJECTS

- e-Harbours – Smart grid municipality Zaanstad www.reloadit.nl
- FP7 Web2Energy
- PowerMatching City II
- Green Deal IT Amsterdam
- Several feasibility studies and consults for energy grids, e.g., reuse heat from data centres and all electric smart controlled urban areas.

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enerGQ BV

COMPANY

enerGQ develops and markets low cost self-learning energy management systems to the full range of organisations from households to multi-nationals in all sectors of the market. Our ambition is to contribute to “stop the global warming” within 5 years by licensing the technology to partners.

The self-learning energy management systems of enerGQ make use of Artificial Intelligence -techniques and visualize excess energy so that it can be reduced easily. Savings on the energy bill vary from 5% to 30%, awareness is created, assets lifetime extended. Payback is less than a year. Flexible business models possible.

enerGQ's unique self-learning energy management technology is an innovation based on three main principles:

1. All our energy consumption is a result of human actions
2. The ultimate sustainable form of energy is the energy that is not being used

3. We further reduce energy consumption as we experience the savings

The automatic base-lining software is often used as a starting point or a recalibration of a roadmap to reduce the carbon footprint of individuals and organisations.

PRODUCTS

enerGQ is supplying the complete energy management solutions on a limited basis to small organisations and individual consumers of energy (i-CARE) and to large organisations to receive feedback for the continuous technology development.

enerGQ is supplying its technology on a license basis to large energy consumers, but also more and more to partners that are supplying complementary technologies and services to consumers of energy in the Netherlands and abroad in order to achieve our ambition.

NETWORKS

- Energy Valley
- Energiebesparing Noord-Nederland
- Slim wonen met energie
- I-Balance / Hooghalen Duurzaam
- Noorden Duurzaam

PROJECTS

- weCARE
- Energy Challenges
- 1000 slimme huishoudens Groningen
- Slim en Snel



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Laborelec NL

COMPANY

Laborelec was formed in 1962 to support the Belgian electricity producers in research, development and special services. Over the past decade, Laborelec has expanded its activities internationally. It is now also working for the GdF SUEZ group, of which it is a subsidiary, as well as for foreign grid operators and industrial clients. The Belgian grid operators are also shareholders, in addition to GdF Suez.

For many years, Laborelec has been active in renewable energy production and distributed production, more specifically in the interaction with the electricity grid. Think in terms of the quality of electrical power supply, protection, assets, and control. Through these projects, Laborelec has accumulated vast expertise in decentralised energy generation, energy efficiency, SMART lighting, control of generators (PV, micro CHP, and wind) and loads (heat pumps, electric vehicles).

PRODUCTS

Laborelec's core product is the expertise of

providing intelligence to existing electricity grids or electricity grids to be built. This intelligence ensures an optimal balance between various parameters from the technical-economic perspective of the market parties in question. For instance, to prevent overloading or congestion, Laborelec can add asset-protective intelligence to the grids by means of algorithms. In addition, the optimal economic balancing of decentralised generation can be exploited by adding intelligence.

NETWORKS

On its campus, Laborelec has its own smart grid that can run in island mode to provide the campus with sufficient electrical power.



This smart grid serves as a test and research environment for various projects.

PROJECTS

- Modienet
- LINEAR: www.linear-smartgrid.be
- SLEM: www.laborelec.be/ENG/electricity-grids-and-end-use-egcu/smart-local-energy-management/
- KOEMPEL: <http://tki-switchzsmartgrids.nl/projecten/kostenefficient-energiemanagement-bedrijvenparkniveau-limburg-koempel>
- INZET: www.rvo.nl/subsidies-regelingen/projecten/intelligent-netwerk-zeewolde-en-energie-transitie-inzet

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Resourcefully

COMPANY

Resourcefully is a smart energy consultancy firm providing project management tasks and technical services to the public and private sector in the Netherlands and Europe. Resourcefully's mission is to develop and operate innovative products and services in the field of smart energy. Initiation and management of European funded projects is a main company expertise. Resourcefully has experience in applying smart energy solutions with a wide variety of partners. This resulted in projects cooperating with municipalities, provinces, grid operators, and national governments.

PRODUCTS

Resourcefully innovates with the www.AmsterdamVehicle2grid.nl project, enhancing solar energy integration with e-mobility. This project is executed with Alliander and Mastervolt. Resourcefully supports the European e-harbours project, led by the municipality of Zaanstad. Winner of the 'Alliander Innovation Award' in 2013 for the pioneering pilot

REloadIT, where the generation of local solar power is connected to an electric car charging system through a Smart Grid. Resourcefully has analysed possibilities for a smart energy grid on the Maasvlakte-2 for the Port of Rotterdam authority and collaborates with ENECO to develop this ambition further.

NETWORKS

Resourcefully disposes over a wide national and European network of experts in the Smart Energy Sector. These are experts in the fields of: applied technology, grid operators, energy rules and regulations, innovation managers and governance.

PROJECTS

- The European Smart Grid pilot project e-harbours
www.eharbours.eu
- The Smart Grid pilot REloadIT
<http://reloadit.energygo.nl/en/over/smartgrid>
- The Amsterdam Vehicle 2 Grid project
www.amsterdamvehicle2grid.nl
- The EU inventory of Greening by IT project,
www.greenitnet.com

- Smart Grid quick scan for the Project Office Maasvlakte-2.



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Tebodin

COMPANY

Tebodin is an independent, multidisciplinary consultancy and engineering firm with a turnover of 223 million euros (2011). Tebodin offers her clients worldwide the knowledge and experience of 4,000 experts in industry: health and nutrition, oil and gas, energy and environment, chemicals, infrastructure and property. The company has a network of offices in West, Central and Eastern Europe, the Middle East, Asia and Africa. Tebodin is part of Bilfinger Berger SE, an internationally active engineering and services company with a leading position in its markets.

PRODUCTS

Tebodin provides knowledge about smart grids in relation to energy production, energy distribution, energy supplies and the interfaces between them. Tebodin is able to switch quickly and practically between the level of concept and the level of detail. Tebodin combines years of experience and knowledge involving sustainable energy systems with knowledge of heating, electricity, natural gas, biogas, green gas networks and

measurement and control systems. Because of this, Tebodin is able to supervise smart grid projects from idea to delivery as a system integrator.

SERVICES

- Flexibility is the key aspect in smart energy systems (e.g. heat, cooling, gas, electricity). Tebodin executes audits to determine the flexibility of plants and industrial processes.
- Focus on smart energy systems in the industry
- Preparing basic smart grid business cases as well as detailed design of energy production and distribution systems designing urban heating systems, electricity grids and gas networks.
- Designing required measurement and control systems preparing specifications for the benefit of the procurement process project support (permit, project management, construction management).

PROJECTS

- As a system integrator, Tebodin is supporting the energy consortium in the development of the business case for a very large smart grid project in Leuven; www.tweewaters.be



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Tenergy Group

COMPANY

Tenergy Consult was formed in 1999. It is specialised in performing feasibility studies in the field of energy and designing energy systems and infrastructure for gas, electricity, heat and CO₂. In addition, Tenergy manages these operations. Tenergy Services was added to the group in 2004. Overall, Tenergy serves approximately 600 clients in the Netherlands. On the basis of detailed knowledge of the processes in the energy market and of technology, Tenergy can demonstrate the feasibility of smart grids (supply and demand balancing) and design them. Since May 2010, Tenergy Services is also established in Canada for the Canadian and North American market.

SERVICES

Tenergy offers clients data presentation via an internet portal and automates the control of CHPs, lighting and other controllable systems such as heat pumps. This is done with market price positions taken on the OTC market (futures market), day-ahead market (APX), Intraday Power market and imbalance

market. Tenergy offers a 24/7 service, which enables the client to achieve economically optimal operations at all times.

In addition, Tenergy advises the client on how the latter can optimally use its technical system on the basis of current market dynamics.

The web portal (tooling), combined with the hardware (Tenergy box) in the field, ensures the market price-driven balancing of the supply and demand of electricity. This balancing constitutes the core of smart grids, resulting in Tenergy having operational proven technology.

NETWORKS

- Energie Bedrijf Overbuurtsche Polder BV (Bleiswijk) with its own gas grid and comprehensive Tenergy monitoring and largely control of set CHP-capacity.
- Nieuw-Prinseland (Dinteloord) article 2 gas grid/energy web with CHP and lighting control.
- Greenhouse segment with collective CHP (600 locations automated in the Netherlands)



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UCPartners

COMPANY

UCPartners is a specialised consultancy for the energy industry. With a small team of highly experienced industry experts we address strategic, operational and technology issues of utility companies in NW-Europe.

SERVICES

In 2005, our team set out to redefine the energy market and has been successful in doing so. Almost a decade later we continue to help our clients manage the impact of energy transformation and new technology on end-user behaviour and value creation. Our services are based on the concept that success is redefined by new capabilities in a highly challenging market. Technology 'makes everything possible' but fails when it does not connect to people who make change really happen.

UCPartners is currently assisting a large Dutch Distribution System Operator with the launch of an integrated Information and Operational Technology (IT/OT) department by providing content driven leadership through interim

management of the Digital Grid Information and Security Management practice.

UCPartners is also launching Forstrom www.forstrom.nl, a new smart meter based energy supplier for retail customers and small businesses. This supplier will enable energy prosumers – the 'real users' of the intelligent grid – to manage their energy balance.

We see energy as a social, technological and economic issue that will only be solved by the combination of behavioural and cultural change, technological innovation and significant investment. Integrating these perspectives is our core competence.

PROJECTS

- First implementation of an integrated Information Technology and Operational Technology (IT/OT) department at a DSO (2014) | First 100% smart meter based energy supplier for prosumers (2014) | Milestone for training 400 energy professionals since 2005 (2013) | First comprehensive analysis of Dutch energy balance (2010) | First consumer pilot of in-home energy



management displays (2009) | First residential mini co-generation pilot in The Netherlands (2006)

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Valstar Simonis BV

COMPANY

Valstar Simonis is an independent Dutch engineering firm in the area of sustainability, energy supply, comfort and safety in buildings. Over eighty staff members work from five branches in Rijswijk, Eindhoven, Apeldoorn, Amsterdam and Groningen. Valstar Simonis represents reduced energy consumption, effective and efficient use of water and materials, comfort, flexibility and installation design tailored to the use phase.

SERVICES

Valstar Simonis was originally an installation consultancy with a strong focus on sustainability, even before the concept was given that title. The firm stands out because of its broad vision, looking across borders. The Valstar Simonis engineers not only pay attention to the building, for example, but also to the surrounding area and objects that demand or actually supply energy. This is why the company develops energy concepts as an integral part of a smart grid. It also supports its clients with a broad view of both Total Cost of Ownership and investment costs. This

gives clients a realistic picture of the total costs, including operation and maintenance.

NETWORKS

- Dutch Green Building Council
- Nationaal BIM-Platform

PROJECTS

- Research into the use of a smart grid for Moorlodges in Erica;
- Vision for Heating Network in Hengelo-Enschede;
- Central energy generation and supply (heating, cooling) to existing and new buildings of Shell Central Office in the Hague;
- Energy exchange (waste heat) between Town Hall Berkelland and neighbouring factory (Friesland- Foods/Campina);
- Design of central energy generation and supply to the theatre, congress, hotel and catering buildings of Hof van Cranendock in Soerendonk (heating, cooling and electricity);
- See also:
<http://www.valstar-simonis.nl/werkwijze>



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Almende BV

COMPANY

Almende is an SME (B.V.) for Research & Development, formed in 2000 and part of the Almende group. The company focuses on the implementation of principles of self-organisation by means of IT solutions. Its core business is performing applied R&D activities and contract research in the field of self-organisation. With the results of its research, spin-offs are formed that market the acquired knowledge anchored in prototypes and thereby realise innovative products and services. Spin-offs formed in the past revolve around improving human communication (ASK Community Systems B.V.), logistics (Deal Services B.V.), context awareness (Sense Observation Systems B.V.), and swarm robotics (Distributed Organisms B.V.).

PRODUCTS

Almende's primary product is knowledge. Knowledge of self-organisation, agent technology, artificial intelligence, agent-based simulation, and distributed network solutions. Almende applies this knowledge in contract research, also in the fields of energy

efficiency and smart grids. In the latter domain, we focus on agent-based solutions for the coordination of smart energy grids. Furthermore, Almende develops open-source general-purpose agent technology (*chap.almende.com*).

NETWORKS

- R&D contacts with all Dutch universities and several European research institutes and companies
- Participant in the DevLab technology Cooperation (Eindhoven)
- Participant in four large European grants projects and several national projects in the field of energy efficiency and smart grids
- Previous activities in the context of smart grids, undertaken together with Betronic, Essent, and Energieonderzoek Centrum Nederland (ECN)

PROJECTS

Almende has established a track record in the sphere of European projects concerning energy efficiency, in which knowledge of direct relevance to the development of smart

grids is being acquired. Almende is participating in the FP7 projects: All4Green (energy-aware networks of energy-aware data centres), Seam4Us (energy-aware public buildings), Adapt4EE (energy-aware architectural processes), and Inertia (tertiary prosumers in smart grids).



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Aurum Europe

COMPANY

As a human oriented company, Aurum has a clear mission: to emancipate the EU energy consumer. Average energy consumers do not have insight into their residential energy consumption. People are unaware of how much gas and electricity they are consuming compared with last year's bill. In 2009, Aurum was founded on the belief that well-informed households structurally change their energy behaviour, habits and attitudes. Direct, contextual energy feedback is key for empowering people in relation to their energy consumption. Meaningful information, concerning the historical, current and future energy consumption, increases the ability to minimize energy spillage without concessions on individual comfort. The Aurum home energy management system provides such information. By actively showing how to prevent energy wastage and related financial benefits, people become aware and get motivated to make energy-efficient choices. Through actively supporting Aurum's community members with notification

services, they reduce their energy bill by 9% on electricity and 14% on gas.

PRODUCTS

The Aurum toolkit comprises a 'self-learning information service' which is compatible with 97% of all Dutch gas and electricity meters; analogue, digital and smart meters. The information management system is based on state-of-the-art technology (Facebook-alike). The 10-second interval data (electricity, gas, heating, solar, weather) is contextualized and instantly presented via an in-home energy display, smartphone, tablet and/or computer. At the moment, Aurum services more than 1000 households. Aurum actively motivates consumer (group)s through self-developed activation methods based on extensive field research. Energy becomes integrated in social networks, which stimulates energy efficient consumption and investments

PROJECTS

Social housing corporations | Municipalities | Local energy services | Solar panel providers | Employee engagement via Top-500 corporations | Internationally active in EU.



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CimPro

COMPANY

With its products and services, CimPro wants to contribute to a more sustainable society. By using the newest technologies in the fields of telemetry, remote control and smart software, the company contributes to a more efficient use of energy. In this manner, reductions in energy consumption and CO₂ emissions and cost savings go hand in hand.

CimPro exclusively provides state-of-the-art technologies, manufactured by worldwide companies. With respect to smart grids, CimPro has two markets: network providers and industries. For the network providers CimPro supplies hardware and software for the automation of distribution cabinets. These are the substations in the districts where MS changes to LS. CimPro supplies energy meters up to 5,000 A for measuring electric power, short-circuit indicators, actuators for remote-controlling switches, and comprehensive control and data communication to management systems (IEC 104 standards). For the industrial market CimPro supplies energy management systems, which provides detailed

information about the energy consumption of several production lines. The management system provides benchmarks and clear reports.

PRODUCTS

Products related to smart grids:

- Energy meters up to 5,000 A
- Quality meters
- Short-circuit indicators
- Local control and data storage
- Alert systems
- Data communication based on IP technology
- Energy management software

CimPro supplies only open systems, which can be further maintained by the end user as well as the system integrator. Systems are based on standard products and are using standard protocols. An increasing number of suppliers of industrial control systems are conforming to these standards. As a result, more and more products of different manufacturers are interchangeable.



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Cisco Systems Nederland

COMPANY

Today, the Internet connects people, processes, data and now also things. This so-called 'Internet of Everything' is changing the way people work, live, play and learn. Cisco's network solutions form the foundation of the public internet, business IT and OT networks. This basis is formed by Enterprise Networks, consisting of routers and switches with integrated security, permitting a new, flexible way of working, independent of time and place. In addition, Cisco offers solutions in the areas of Collaboration and Cloud, Data Centres & Virtualisation. Cisco believes that with a collaborative effort across institutions and organisations, we can build tomorrow's networks – and harness the collective power of geographically distributed resources.

PRODUCTS

Primary and Transmission Substation Automation - Cisco solutions include secure ruggedized routers and switches to handle the most demanding substation environments. Examples:

- Cisco 2520 connected grid switch and Cisco 2010 connected grid router for primary substation applications. Cisco 1120 series Connected Grid Router for Field Area Network applications and IE2000U series DIN rail switches for resilient substation bus architectures.
- Grid Security: Cisco solutions include physical and cyber security solutions and services to address regulatory compliance and threat mitigation. Features include specific SCADA signatures for Intrusion Prevention.
- Data centre and control centre: Cisco solutions provide a highly secure, scalable platform for data management and storage for grid operations.
- Fog Computing: The new Cisco IOx capabilities allow customers and solution providers across industries to develop, manage, and run software applications directly on Cisco industrial networked-devices. This includes hardened routers, switches, and IP video cameras.

NETWORKS

Cisco is participating and a driving force in a number of industry initiatives as well as standard bodies relevant for the utility industry:

- Standard bodies: IEC TC57, IEEE, IETF, ZigBee etc.
- Industry Associations : IPSO alliance, WI-SUN, HomePlug, Esmig, G3-PLC Alliance, Homeplug, Gridwise etc.
- UCA groups: CIMug, 6185oug, OpenSGug
- UCA groups: CIMug, 6185oug, OpenSGug

PROJECTS

Among others: BC Hydro, First Wind, Duke in US/Canada, Ausgrid in Australia and Egorlyskaya in Russia.



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Energiemanager Online

COMPANY

Energiemanager Online (EMO) translates data flows from smart meters into useful feedback on energy consumption at home and at work. EMO develops web-based software for this. Moreover, the company ensures – as independent provider – that smart meters automatically retrieve the data. As a result of more complex energy situations in houses (e.g. PV systems, heat pumps, high efficiency boilers), EMO extends its software with modules. A web-based tool is available for almost every situation. This way, users are provided with insight into their overall energy management.

PRODUCTS

Consumers use a free basic version. Optional features include a link with the smart meter. This basic version can be extended with a PV module (for the use of solar panels), a heat pump module and a cost module. EMO also builds this tool as private label for, among others, energy companies, PV panel suppliers and facilities service providers. Finally, EMO has various company solutions for multi-

sites, in which smart meters retrieve data and provide feedback in a practical and user-friendly way.

PROJECTS

- Rendo Energyview; www.rendo.nl/energyview/
- Kortenoord Energiemanager van Bouwfonds; www.nieuwkortenoord.nl/



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HOMA BV

COMPANY

HOMA B.V. is a leading technology company, specialised in the development of solutions for integrated control and management of small, centralised energy units. These include wind turbines, heat pumps, storage systems, PV panels, smart meters, micro-CHPs, etc. Such solutions are deployed in the design of so-called Virtual Power Plants (VPPs), and generally play a key role in realisation of smart grids.

PRODUCTS

HOMA's most important product is an advanced solution with which energy companies can manage large parks of micro-CHP units, and can integrate and manage the data from electricity, gas and heat meters. It also allows them to manage devices which produce extra energy or consume energy, such as PV panels and heat pumps. The solution has a state-of-the-art Service-Oriented Architecture (SOA), making it simple to change and/or add functions. E.ON and other large European energy companies already use this solution.

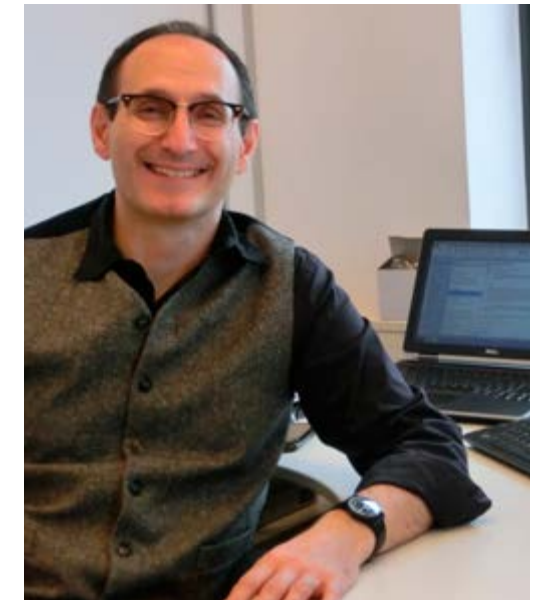
NETWORKS

HOMA works closely with the University of Twente and is therefore a member of an extensive research network. HOMA is also a member of the Technology Circle of Twente, a network of high-tech companies in the Eastern Netherlands. Furthermore, HOMA is a member of IBM's PartnerWorld programme and has access to the network of IBM's 'Innovation Centres' worldwide. Last but not least, HOMA is a collaborative partner with a number of Europe's largest energy companies.

PROJECTS

As a Dutch party, HOMA is involved in one of the European Joint Technology Initiatives (JTIproject) together with E.ON, Ideal Boilers and Ceramic Fuel Cells. A large-scale European demonstration project concerning the availability of fuel cells (SOFC). HOMA is also a collaborative partner in a Dutch-German project, financed by the INTERREG programme, whose focus lies on the installation and coordinated operation of micro-CHP equipment. Furthermore, HOMA

is a partner in a research programme of the University of Twente, aimed at intelligent management of energy flows in households.



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IBM Nederland BV

COMPANY

IBM, which has been in existence for more than 100 years, is one of the world's leaders in IT-services, hardware, software and research. Mission: the creation of a smarter world. Computer capacity is no longer reserved for computers in the traditional sense. There are chips in cars and cameras, and even our highways, medicines, as well as energy supply are becoming intelligent. In addition, everything is inter-connected via the internet. We also have at our disposal new, powerful systems and advanced analysis capabilities to convert mountains of data into knowledge, insight and meaningful information. IBM is helping energy companies by adding digital intelligence to their networks. These smart networks use sensors, meters, digital controllers and analysis tools for automating, monitoring, and controlling the twoway flow of energy – from power plant to power outlet. An energy company can optimise its network performance, prevent outage and restore outage more quickly, and ensure that clients are able to manage their energy use on the net right down to each individual appliance.

'Smart' networks are also able to include sustainable energy and react locally to distributed energy sources or electrical vehicles through the power outlet.

PRODUCTS

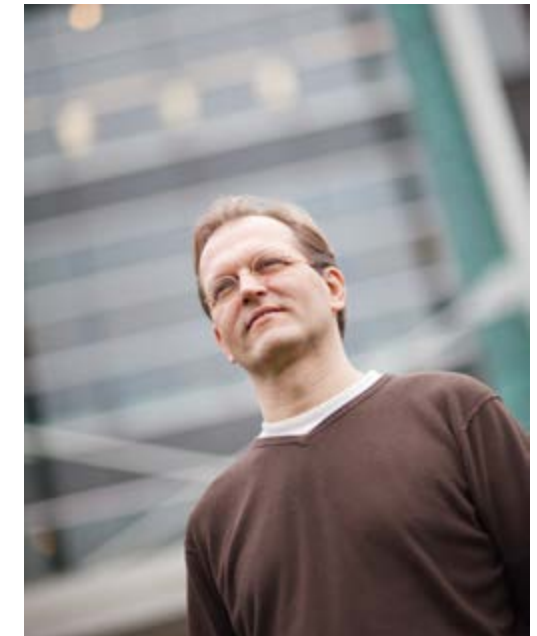
With its products and services, IBM is helping clients to make this smarter world a reality. IBM offers consultancy and system integration services, software for data management, integration, analysis, security, monitoring and management, hardware specialised in real-time processing of large quantities of data, and research services for developing smart algorithms.

NETWORKS

IBM is playing an important role in many international and national bodies for standardising and cooperating on smart grids. IBM is the co-founder of the Global Intelligent Utility Network Coalition, where more than ten large energy companies cooperate on smart grids.

PROJECTS

IBM is active in hundreds of smart grid projects worldwide from small pilots to large-scale research projects. Together with clients from all sections of the energy value chain, IBM is working towards the realisation, integration, exploitation, and management of smart grid systems.



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ICT Automatisering Nederland BV

COMPANY

The objective of ICT Automatisering, is to ease, simplify, and improve the operating, production, and communication processes of its customers. It does this on the basis of high-quality technological knowledge. It presents this knowledge in the form of inventive and effective product/market combinations. Inventive, because every standard solution is enriched with state-of-the-art technology; effective, because the company has in-depth knowledge of the industries in which it operates, so that it can provide proven and bespoke solutions. ICT operates in six so-called Verticals: Automotive, Logistics, Machine & Systems, Industrial Automation, Energy, and Healthcare.

PRODUCTS

ICT provides software services for smart grids across the board. ICT is involved in control technology for CHP's, wind turbines, and other innovative energy systems, monitoring, administration and management of the energy grid, and developing devices for end-users

such as micro-CHPs. On the basis of its involvement in the Smart grid pilot in PowerMatching City Hoogkerk, ICT has developed a software product for smart grid applications in urban environments and E-mobility.

NETWORKS

ICT is one of the founding partners of the Universal Smart Energy Framework (USEF) www.usef.info, an industry initiative to standardise an open and consistent framework of specifications, designs and implementation guidelines for smart energy systems.

PROJECTS

- PowerMatching City
www.powermatchingcity.nl
- PowerMatching City to the People
<http://tki-switch2smartgrids.nl/projecten/powermatching-city-to-the-people-pmcttp/>
- Greenflux Service and Operations Platform
- Smart Grid in Balans:
<http://tki-switch2smartgrids.nl/projecten/smart-grid-in-balans-sgib/>
- Heerhugowaard Stad van de Zon:
www.smartenergycollective.nl



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Interxion

COMPANY

Interxion (NYSE: INXN) is a leading provider of cloud and carrier neutral colocation data centre services in Europe, serving a wide range of customers through 37 data centres in 11 European countries. Interxion's uniformly designed, energy-efficient data centres offer customers extensive security and uptime for their mission-critical applications. With more than 500 Connectivity providers and 20 European Internet exchanges across its footprint, Interxion has created cloud, content, finance and connectivity hubs that foster growing customer communities of interest.

Interxion was founded in 1998 in The Netherlands and is headquartered in Schiphol-Rijk (Amsterdam Region). Interxion has 8 data centres in the Amsterdam region and uses 100% renewable energy.

For more information, please visit www.interxion.com.

NETWORKS

- Stichting GreenICT
- Smart Energy Collective
- The Green Grid
- IIP Duurzame ICT
- Green IT Amsterdam
- Uptime Institute (Cofounder EMEA Chapter)
- EU code of conduct

PROJECTS

- LTA agreement with the Ministry of Economic Affairs on reducing energy in ICT sector



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Itron

COMPANY

Itron is the leading provider of energy and water resource management solutions for nearly 8,000 utilities around the world. The company offers end-to-end solutions that include electricity, gas, water and thermal energy measurement and control technology, communications systems, software and professional services. With more than 9,000 employees operating in 130 countries, Itron empowers utilities to manage energy and water resources responsibly and efficiently.

PRODUCTS

From measurement and network communication technologies to software and data analytics, Itron's innovative products, breadth of solutions, and value-added services have brought us to a position of global leadership. Itron helps thousands of utilities worldwide to optimise the delivery and use of energy and water by providing intelligent metering, communication and utility software solutions.

Itron offers a broad array of integrated

products and services to help your utility to meet key operational and strategic objectives and to thrive amid the energy and water challenges we all face – from improving operational efficiency and optimising costs, to connecting with and empowering consumers.

NETWORKS

- Itron has strategic partnerships with leading security technology suppliers for key management infrastructure, security auditing and testing.
- Itron also contributes actively to the elaboration and improvement of security cipher suites.
- Itron contributes actively within ESMIG on the definition of end-to-end security requirements for Smart Metering components.
- Itron is involved with work for the DLMS COSEM protocol.
- Itron is deeply involved in security standardisation via OpenSG/AMISec and NIST Cybersecurity.



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KPN

COMPANY

KPN is the leading telecommunications and IT service provider in the Netherlands, offering wired and wireless telephony, internet and TV to consumers. KPN offers business customers complete Telecommunication and IT solutions. KPN IT Solutions offers IT services and is the Benelux market leader in the area of infrastructure and network-related IT solutions. KPN provides wholesale network services to third parties and operates an efficient IP-based infrastructure with global scale in international wholesale through iBasis. Personal, simplicity and trust are KPN's three core values. We expect all employees to understand these values and to act accordingly.

PRODUCTS

KPN provides several services to different parties within the Energy Industry, varying from hosting and workspace services to specific communication solutions for Smart Metering and Smart Grids. KPN, Alliander, DNV KEMA, TNO and Radboud University

have set up a European cyber security knowledge centre, the European Network for Cyber Security (ENCS). ENCS will research, test, share knowledge and train personnel in the field of cyber security for critical infrastructures such as energy, water and telecom networks. All with the objective of helping infrastructure owners to protect their assets against cybercrime.

CORE SOLUTIONS

- IT Integration Services
- Datacenter Services
- Workspace Services
- Connectivity Services
- Security Services
- Consulting Services

NETWORKS

- Smart Energy Collective
- Global e-Sustainability Initiative (GeSI) / Smart 2020
- European Network for Cyber Security (ENCS)
- ICT Roadmap
- Entrance



PROJECTS

- Amsterdam Smart City
- Smart Energy Collective projects at Schiphol Airport, Heerhugowaard and Hoog Dalem
- Toegankelijke Energie Informatie (TEI) – TESSG113022

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Metsens

Energy Monitoring Systems

COMPANY

Metsens was founded in 2008, on discovering a lack of enthusiasm among energy supply companies to monitor individual usage. Metsens makes energy monitoring systems that enable individuals and companies to monitor and signal their energy usage. At general and detailed levels, it shows how much energy people actually use and how much it costs. Metsens is convinced that detailed data of gas, warmth and electricity (GWE) consumption represents great real value from which end users can benefit.

PRODUCTS

The first energy management system was introduced early in 2010: a GWE monitoring website for housing corporations, companies and government buildings. Oursens allows end users and property owners to monitor their GWE usage by the month, by the day or even by the hour. This has the direct benefit of saving money on GWE bills. The availability of information will increase the use of



renewable energy and reduce carbon pollution.

PROJECTS

- Cité Rotterdam: delivery of an energy management website for 521 student apartments in Rotterdam, for both the administration of Vestia and the end users. Energy consumption is visualised on the website and in apps.
- Hanzevast: delivery of an energy management website for real estate fund provider Hanzevast for all buildings with high energy usage. The building manager can see and compare the energy usage of all buildings. End users can monitor the

- energy consumption on a website and app.
- Sensor City: delivery of an energy management website for all public buildings in the city of Assen. Metsens also produced information screens to show the public how much energy the buildings use and what activities Assen undertakes to minimise this.

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Priva BV

COMPANY

Priva is a privately owned company and key player in the field of automated climate and energy process control in the Horticultural and Building Intelligence markets. Priva's core competencies are hardware and software development, process management and energy monitoring and, through sister company Van Beek, consultancy services. Priva considers it to be its duty and responsibility to use and manage resources, nature, and the environment with the utmost care. That is why innovation with a sustainable dimension is a high priority. Priva is a knowledge-based organisation with 400 employees based in eight countries serving clients in more than 70 countries.

PRODUCTS

Priva's controls platform has been deployed for many years in connecting (renewable) energy systems in micro-grid environments, including an interface for energy trading. This platform results in greater energy savings and in CO2 emission reductions compared with less advanced systems, while comfort levels



are optimised and demanding performance targets are met. Priva's expertise covers both know-how of the system components and broad experience in micro-grid and smart building projects.

NETWORKS

Priva is a member of most relevant national and international business and technology associations.

PROJECTS

As a world market leader for horticulture and market leader in the Netherlands for building automation, Priva participates through her

partners in many sustainability projects. See www.priva.nl for press releases.

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Quby

COMPANY

Quby is changing the way people are experiencing energy. We are passionate about creating intuitive tools that people love to use. In Amsterdam, over 50 people at Quby form an inspiring and ambitious international team of experts. Our clients are top tier companies delivering home services to consumers. Strengthening customer interaction is their common focus. They value our ability to provide strong technical solutions that are easy to use.

PRODUCT

The Quby smart thermostat provides energy insight. Through a smart meter or through our own measurement devices, we collect data about your energy consumption and present it to our customers in an understandable way. In Kwh, m3 and costs, for both current and past usage. The intuitively programmable thermostat guarantees a comfortable home climate. A set of on-board apps provides you with the means to control the device and connect to the back-end services of your energy provider.

Web apps provide secure remote access via smartphone, tablet or computer.

Quby's most compelling case for Energy Providers is the Eneco Toon®, an intuitive thermostat that provides energy insight for the consumer. Facing tough competition and decreasing retail margins, Eneco turned to Quby to adapt its award-winning Home Energy Management platform for mass rollout to their customer base. The Toon® strengthens their brand awareness, decreases cost of sales, enables more efficient support

and maintenance services and increases overall customer satisfaction.

NETWORKS

- Amsterdam Smart City
- Figaro
- Appolon
- Cloud Power Texel
- Vereniging Energie Inzicht
- Open Therm Association



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Qurrent

COMPANY

Qurrent has been operating in decentralised sustainable energy since 2006. Our mission is: assisting consumers to deal more cleverly with sustainable energy on a large scale through both energy saving and energy generation. In 2007, Qurrent won the international Zip code Lottery Green Challenge with its technology.

PRODUCTS

As an energy service provider, Qurrent assists consumers in handling energy more cleverly. It provides three principal services to accomplish this:

1. Support and products for energy saving
2. Support and products for private local energy generation
3. Sell green energy from the Netherlands on a non-profit basis.

Qurrent offers products which can be purchased in various combinations, such as:

- solar systems (pv)
- clear insight into energy use and generation with the Qbox
- insulation

- energy saving advice
- LED lighting

Our primary goal is the total absence of worry for the client; not the sale of individual products. Qurrent's earnings model is completely focussed on this objective. The delivery of green energy is significant proof of this. Qurrent assists clients in saving energy and in generating energy. However, consumers will still have to purchase energy externally at certain times. As a result of our 'worry-free service' philosophy, Qurrent will provide consumers with green energy; in this way the consumer will receive just one easy to follow invoice. Qurrent provides this green energy 'for free' and does not profit from it. The less energy Qurrent delivers, the more it earns from other services and products. In this way, Qurrent's principal goal remains guaranteed: the reduction of energy use and the minimisation of the purchase of external energy.

NETWORKS

- De Groene Zaak [The Green Company] (co-founder)
- E-Decentraal



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Technolution BV

COMPANY

Technolution is an engineering company in technical automation, an innovative SME company with 150 employees. It develops advanced electronics and software solutions for technical information systems and embedded systems. Technolution operates in the traffic and transport sector, high-tech industry, and the energy sector. Technolution distinguishes itself in its capacity to realise integrated technological solutions for its customers, for complex problems in demanding environments.

PRODUCTS

As a project office, Technolution develops (customised) products for clients. Product concepts are SmartBoxx and ChargeBoxx.

NETWORKS

Technolution represents SMEs in Top Sector Energy and is a member of the board of TKI Switch2SmartGrids.

PROJECTS

- Mobile smart grid: smart prioritising of energy demand by electrical cars based on requested transport need.
- Smart Storage: measurement and control system for solar energy storage at district level in batteries for the better utilisation of green energy and support of an isolated company.
- Local controller: a system which monitors the load on various electrical substations and predicts the load on the network, taking into account decentralised power generation and load as the result of charging electrical cars.
- Easystreet/Meulenspie: energy computer for more than 200 households whereby users are given choices in their actual energy use, along with a dynamic energy price, via an interactive display.
- Development of a standard for low cost MS/LS Instrumentation with both the utilities and the Industry
- Development and implementation of the Flexiblepower Alliance Network (FAN) standard for households, businesses,



- energy companies, ESCOs to accelerate the future of sustainable energy together.
- Development of an extremely low cost smart meter P1 device which provides real time electricity and gas values to the customer via sophisticated Apps.

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Unica

COMPANY

With seventeen branches, nine specialised business units and more than 1,800 staff, Unica is the largest independent all-round system integrator and technical service provider in the Netherlands. Unica stands for a sustainable, comfortable and safe working and living environment with the best communication applications.

PRODUCTS AND SERVICES

Unica has an extended product and services portfolio to provide (stacked) buildings with technical provisions, such as online universal building management systems, air-conditioning systems, building (terrain) protection, green ICT (cloud) solutions, and sustainable energy solutions.

Unica offers technical sustainable concept solutions, such as Energy Management, Heating/Cooling Storage, local biomass (efficient wood fired power plants – Be Green), solar panels (PV), and infrastructure solutions for electric transport.

With the highest quality, Unica is able to analyse and manage these, and to have them

seamlessly connected to smart grids. The specialised Unica Ecopower business unit guarantees this knowledge and experience, manages the sustainable energy solutions, and organises financing. In Greenstep BV (a partnership with Dura Vermeer), Unica is also a specialist in building renovation with sustainable energy solutions and energy performance contracts.

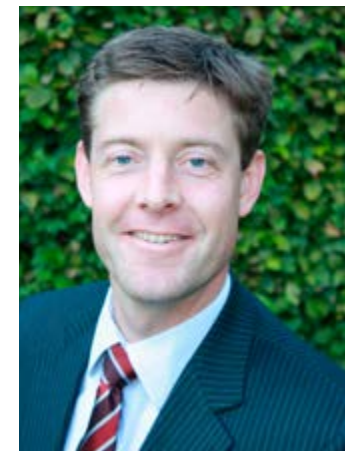
NETWORKS

- Dutch Green Building Council (DGBC);
- Uneto VNI
- ICT Office
- FedEC, Federation of Energy Consultants
- The Green Company:
www.degroenezaak.com/nl/partners
- MVO Netherlands:
www.mvonderland.nl/partners

PROJECTS

- Smart Energy Collective:
www.smartenergycollective.nl
- More than 200 WKO projects realised
- Financing and exploitation of more than twenty sustainable generation installations

- More than ten (wood-fired) power stations:
www.begreenenergy.nl
- Installation of charging stations for electric transport
- Several partnerships with Dura Vermeer (including GreenStep and UDV Energy)
- Installation of many large PV projects, including financing



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UPC Business

COMPANY

UPC Business provides internet, television, telephone and network solutions to the corporate market. It owns an intricate network of more than 11,000 kilometres of optic fibre, and uses that to provide a broad portfolio of services. By combining these, UPC Business is able to create and manage the best solution for every client. UPC Business is a subsidiary of UPC Netherlands.

PRODUCTS

UPC Business provides services to both small businesses (Fibre power) and organisations with several branches (smart VoIP solutions) – from collective television for hotels and housing corporations to wholesale services for resellers. Since 2003, UPC Business has also been a leader in Voice over IP (VoIP), and delivers IP TV to many clients (including the health care sector). UPC Business also delivers high-quality data services to companies in the energy sector for office automation and for the management of the energy network of electricity suppliers.

Through the Coax network, UPC is present in more than 2,8 million Dutch households. For this reason the Coax network is also extremely suitable for traditional as well as modern interactive media services. Smart grid solutions are high on the agenda. The launch of the next generation set-top box, the 'Horizon media box', provides a media gateway which integrates apps, internet and social media with television. This, combined with the second screen on which the viewer receives television content, makes it possible to reach clients via various social media channels. By connecting this Horizon Gateway to the smart meter it becomes possible to exchange consumption data interactively and cost efficiently. In this way, energy companies come to know more about the client's needs, and they can better respond to these.



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APX

COMPANY

APX is Europe's premier provider of power exchange and clearing services for the electricity wholesale market, operating transparent platforms in the Netherlands, United Kingdom and Belgium.

PRODUCTS

As an experienced and innovative European energy exchange, we offer efficient, transparent and secure electronic trading environments and provide market data for traders, suppliers and industries. In addition, APX promotes market innovation and creates new opportunities by working closely with its members, TSOs, and other exchanges to improve the functioning of the European energy market. APX strives to improve market efficiency and produce more predictable product price indices, by integrating smart products in the Day-Ahead and Intraday markets, for example.

APX is also committed to developing new products and services for and with parties active in the electricity system to contribute to the energy transition and its new market

development needs. By linking distributed energy sources (demand and generation) via a national flexibility platform to the (inter) national energy markets, APX aims to secure efficient pricing, fair value for providers and procurers of resources and reliable processes.

NETWORKS

APX participates in initiatives with research institutes, consulting firms, market parties and network operators to analyse the needs of the changing electricity markets.

PROJECTS

APX actively participates in the Denktank, organised by CE Delft, to analyse the changing energy system and accompanying needs to further develop the future energy market. APX is involved in IMPRESS, a smart grids research project based on the EU Horizon2020 programme with Belgian institute VITO, Danish institute DTU, software company Ensero and supplier Anode.



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Essent

COMPANY

Essent is the largest producer of (renewable) energy in the Netherlands. The company delivers electricity, gas and heat to private and business customers. The Netherlands and Belgium are regarded as the home market. Essent accounts for one fourth of all sustainably produced electricity in the Netherlands and employs 3,800 people (FTE). The coordination between all the sources and users of energy becomes increasingly important in the transition towards a sustainable, affordable and reliable energy supply. Therefore, Essent strives to be among the frontrunners in the development of smart energy systems and related services. With this, Essent supports energy users in their need to organize their energy use and production very simple and in the most optimal way according to their wishes.

PRODUCTS

Essent is working on the energy of tomorrow. This future will consist of large wind parks at sea, efficient power plants converting biomass into power and heat that is supplied

to customers in the vicinity. Small local energy systems such as solar panels, heat pumps and micro co-generation will provide energy to residential areas and individual houses. Plug in hybrid and full electric vehicles will be connected to the power grid to charge their batteries with clean electricity at times when this is most convenient.

PROJECTS

- Powermatching City II with a leading role in propositions and customer research
- SEC Heerhugowaard with a leading role in customer research and developing the aggregator role
- USEF with a role in the design team to build a Universal Smart Energy Framework
- Demand response in industrial processes



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GEN

COMPANY

Founded in 1997, GEN has grown and evolved alongside the Dutch and European energy markets. We are experts in the energy sector, where the only certainties often seem to be rapid and constant change, and a necessity to update and accommodate new market conditions. Among the most important factors driving this change are: market liberalisation, the unbundling of energy production and grid management, energy transition, national and regional legislation with EU regulations and international political realities. The consequences of these and other factors create challenges requiring attention and adaptation by our clients, their clients, and ourselves. Against this background, it is obvious that the added-value of integrated process and data management across the entire energy value chain, from transport to energy trade and supply is absolutely business-critical.

PRODUCTS

- GEN Professional Services:
- Market Consultancy: translates market

developments into complex energy data analyses, business opportunities and related best practice processes.

- Business Consultancy: process (re-)design, development, implementation and optimisation. Translates business requirements, incl. market processes, into solution design.
- Projects: connects our consultancy services and our software solutions to optimise operational processes. Services include business analysis, solution design and implementation, controlled change management, project management, application management, maintenance and support.
- GEN Utility Data Systems: specialist software solutions for the entire energy value chain. GEN eBase is our powerful and comprehensive solution for data and time series management, analysis, forecasting, manipulation and interpretation and is at the core of our solution offering.
- GEN Managed Services: offers various forms of services, varying from office hours SLAs to full 24x7 support. Services range from 3rd



line support for diagnosing and remedying incidents in the GEN eBase software to full application management and hosting of GEN eBase installations.

NETWORKS

- Eurelectric
- Nederlands-Duitse Handelskamer
- Lid van DVO
- Smart Energy Collective
- Smart Grids Flanders

PROJECTS

- Smart Energy Collective pilot projects
- USEF review board

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Greenchoice

COMPANY

Greenchoice is a gas and electricity supplier that provides 100 percent green energy for more than 315,000 households and organisations. It encourages energy users to generate their own electricity by using the sun, the wind or ambient heat. In addition, Greenchoice offers its customers useful energy saving advice.

Greenchoice's main aim is to accelerate the accessibility and ease with which consumers can generate energy locally. As such, Greenchoice offers organisations and consumers certain administrative services that make it easier for them to generate their own energy.

PRODUCTS

Greenchoice has been supplying, purchasing and invoicing sustainable energy for the last 10 years. During that time, Greenchoice gained a great deal of experience and insight into the generation of energy at a local level:



1. Greenchoice supplies customers with PV installations, including financing and returned energy. For example: the ZonVast project, the ZonKoop & ZonLeen.
2. Greenchoice participates in various local generation projects (sun, wind, biomass and the fermentation of biodegradable materials).
3. Greenchoice participates in smart-grid pilots such as Breda Meulenspie, Breda Easy Street, EVANDER & ZeeNet.

NETWORKS

- Transitiearena Smart Grid
- Topsector Energie Innovatietafel Smartgrids

PROJECTS

- Greenchoice: ZonVast, ZonKoop & ZonLeen
- Smart Grid Breda: Meulenspie & Easystreet
- IPIN: Evander & Zeenet

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Greenflux

COMPANY

GreenFlux is a high level service provider for electric drivers. GreenFlux is working on building a charging infrastructure for electric vehicles throughout the Netherlands. Our goal is to enable electric driving as much as possible, by developing a reliable and complete charging network along the Dutch highways. GreenFlux offers all the necessary services to make electric driving throughout the Netherlands as convenient and pleasant as possible.

PRODUCTS

We have developed our own line-up of charging stations for private, public and business environments, while we also offer a range of high quality charging stations from other manufacturers. Through our multi-platform back office we are able to offer several additional services like smart charging and the clearing of transactions for charging stations of a variety of charge point manufacturers.



PROJECTS

Smart Charging naar de Praktijk (Smart Charging into Practice): In cooperation with our project partners we have developed and tested a protocol for Smart Charging of electric vehicles.

Smart Grid in Balans (Smart Grid in Balance): This project links the production of renewable energy from different sources to the actual charging of electric vehicles. While balancing the supply and demand of renewable energy generation and the demand for electric vehicle charging, large

investments in grid infrastructure can be avoided while sharing of renewable energy in total production capacity is increased. The project also enables electric vehicle owners to see the origin of the electricity used to charge their vehicles.

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MisterGreen Electric Lease

COMPANY

Since the beginning of the industrial revolution we managed to exhaust almost all the natural resources that took the Earth over 200 billion years to create. Accordingly, to preserve the planet for our children, certain things need to change. MisterGreen's lease concept approaches this problem in a unique fashion: MisterGreen's entire fleet is powered by solar power, without making concessions to quality, comfort and design.

Also, MisterGreen is contributing to the electric infrastructure, because at MisterGreen we know how inconvenient charging can be. Therefore, MisterGreen is investing in the Fast Charger Network, a sister company of MisterGreen, developing fast-charge stations for electric vehicles in the Netherlands. These chargers must be inexpensive and accessible for everyone, so that electric driving becomes an option for every citizen. MisterGreen is, as the only lease company of solely electric vehicles, proud of its fleet, and foresees a future where electric driving is not an exception, but the norm in mobility.



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NieuweStroom

COMPANY

NieuweStroom is an electricity supplier facilitating customers to indirectly purchase electricity on the spot market (APX = Amsterdam Power Exchange). NieuweStroom transparently passes the price advantage of 10-30% directly on to its customers by charging the actual spot market price, adding a small transaction fee. NieuweStroom elaborates on the government programme to replace all traditional energy meters by smart meters. To purchase electricity via NieuweStroom a smart meter is a *conditio sine qua non*.

NieuweStroom's vision is that, in the near future, electricity costs will be fully transparent to all end-users. Dynamic pricing encourages people to adjust/optimize electricity consumption habits to be more responsive to market prices. This will result in a more sustainable, efficient and transparent electricity market with reduced peak consumption.

The mission of NieuweStroom is to enable its

retail customers to purchase electricity at the lowest possible costs, by offering dynamic pricing.

PRODUCTS

Contrary to the current market trends of increasing product and pricing complexity and long-term contracts, NieuweStroom is different:

- Transparent invoicing of electricity consumption/supply on an hourly basis, charging the actual spot market price, adding a small transaction fee
- Green certificates (Certificates of Origin) are separately charged
- Freedom of contract: indefinite length and cancellable daily without penalty fees
- Full insight into energy consumption/supply on an hourly basis
- Monthly electricity bills adapted to actual power consumption
- In case no smart meter is installed yet, NieuweStroom will arrange priority placement
- For customers supplying electricity through solar panels or windmills: unlimited



netting on an hourly basis. For net supplies, the customer receives the APX price (minus transaction fee).

PROJECTS

- Real estate management
- Solar energy
- E-mobility
- EnergyPort Peelland
- Mijn NieuweStroom

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Avans

University of Applied Sciences - Lecturate of Smart Energy

INSTITUTE

With around 28,600 students, more than 54 HBO higher vocational courses and 2250 employees, Avans University of Applied Sciences is one of the largest of its kind in the Netherlands. Avans was also awarded the title of best broad-based University of Applied Sciences of the Netherlands in 2013. At the Centre of Expertise for Sustainable Innovation (EDI), the lecturate in Smart Energy collaborates with lecturates in the field of Sustainable Business, Biobased Products & Biobased Energy, Finance & Sustainability and Innovation of Building Processes & Technology. The Centre of Expertise is focused on an integrated approach to research and design for a liveable environment and healthy companies, which are interdisciplinary, effect oriented and support steered. EDI wishes to bundle the strengths of the affiliated lectureships in order to provide a solution for internal and external (sustainability) issues by conducting research with lecturers and students.

RESEARCH

The lecturate of Smart Energy studies how energy-saving and the deployment of sustainable energy can be improved and increased at the device, residential, neighbourhood and commercial park levels through the use of technical aids. The lecturate conducts practical research into three fields:

- Monitoring & Knowledge: how can consumers and companies gain more insight into their energy consumption?
- Embed & Link: how can decentralised and sustainable sources of energy with a non-steerable supply pattern be deployed in the energy infrastructure in and around homes and in industrial utilities?
- Conscious consumership & Prosumership: how can energy-saving behaviour and use of (decentralised) sustainable energy be encouraged among consumers and businesses?

NETWORKS

- Bossche Energie Convenant
www.bosscheenergieconvenant.nl
- Topsector Energie
- TKI Switch2SmartGrids

PROJECTS

- Cost reduction MS/LS Instrumentation – KRIS
www.tki-switch2smartgrids.nl/projecten/kostenreductie-msls-instrumentatie
- Cellular Smart Grid Platform – CSGriP
www.tki-switch2smartgrids.nl/projecten/cellular-smart-grid-platform
- Dong Solar Challenge
www.dongenergysolarchallenge.nl



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CWI

INSTITUTE

CWI (Centrum Wiskunde & Informatica) is the Dutch national research institute for mathematics and computer science and is an institute of NWO. CWI has a strong international position and is renowned for its high quality research. CWI's strength lies in the discovery and development of new ideas, and the transfer of knowledge to society and industry. Smart grids are an important focus area of research, which especially takes place in the 'Intelligent Systems' and 'Scientific Computing' groups.

RESEARCH

CWI works on various smart grid topics, from operations to planning and business. Supply/demand management is investigated using multi-agent systems and electronic markets. Demand side management and revenue management for energy systems are investigated by computational intelligence and algorithmic optimization techniques. Also, research on future network capacity planning is carried out, by evolutionary algorithms. And smart home energy systems

are developed by means of sensor networks. Computational methods are developed to investigate reliability and robustness of electricity networks and network components. CWI collaborates on technical, societal as well as business aspects of smart grids, via (inter)national collaboration with companies and institutes.

NETWORKS

- Active in EIT ICT Labs, in the Smart Energy Systems (SES) theme.
- Relations with industry and academia via various projects and professorships of CWI researchers.

PROJECTS

- IdeaNed: Intelligent Decentralized Management of Networks and Data
- Cocaplen: Computational Capacity Planning of Electricity Networks
- CES: Computational Energy Systems: markets, agents, sensors, and physical behaviour
- Revenue Management, for batteries in smart grids

- Computational Sciences for Energy Research projects
- HV engineering projects
- Various EIT ICT Labs projects on SES



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ECN

INSTITUTE

ECN is the largest Dutch research institute in applied energy research, providing sustainable solutions for the rapidly changing energy sector. ECN is an independent, non-profit research organisation, where over 600 professionals work to contribute to a future sustainable energy system by performing research and technology development and bringing it to implementation. ECN's experts combine the latest insights in (inter)national policies and trends with in-depth, hands-on expertise with technology development.

RESEARCH

ECN's smart grids research focuses on improving the viability of smart grids from both the techno-economic and societal point of view, by optimization of societal acceptance of smart grid technologies and the creation of a stable, forward-looking framework of policies and regulations. ECN combines in-depth knowledge of the international energy system and national and international developments in policy and

regulations with a thorough understanding of consumer behaviour and societal acceptance.

NETWORKS

- Smart Cities Stakeholder Platform: uniting smart cities with providers of practical smart solutions
- Dutch and European Taskforce Smart Grids: designing a coordinated action plan towards the realisation of a smart grid

PROJECTS

- EcoGrid: understanding drivers and creating acceptance for smart meters on the Danish island of Bornholm. www.eu-ecogrid.net
- S3C: increasing involvement of consumers, customers and citizens in active demand management. www.s3c-project.eu
- Advisor to Ministry of Economic Affairs on e.g. the effects of implementation of a network tariff for producers. www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/10/01/effecten-invoering-producententarief.html

- Advisor to the European DG Energy on the role of Distribution System Operators in the smart metering and smart grids environment.



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Energy Academy Europe

INSTITUTE

The Energy Academy Europe (EAE) is aiming to become an international centre of excellence in energy education, research and innovation. It focuses on the transition to a sustainable, reliable and efficient energy future. The EAE applies an interdisciplinary, integrated system approach to energy issues. It creates projects in collaboration with knowledge institutes and companies. Smart grids is one of the five research themes of the EAE.

RESEARCH

Research at the EAE contributes to the development of sustainable energy systems. The interdisciplinary research programme has a multi-commodity approach and focuses on the interoperability and integrity of the energy system. It addresses not only the technical, but also the regulatory, economic and behavioural dimensions of smart energy systems. The EAE lays a basis for a research infrastructure with respect to system integration, databases and modelling. EnTranCe is the EAE facility that offers 'living

lab' opportunities for research, education and innovation.

NETWORKS

The research programme is being developed in collaboration with the partners of the EAE: companies, knowledge institutes, governments and societal organisations.

PROJECTS

- Smart pricing ALgorithms for smart Energy grids (SALE) – RUG with TNO, DNV KEMA and APX
- FlexiHeat – HUAS with a.o. RUG, University of Twente, TNO en DNV KEMA
- Flexinet program – HUAS with a.o. HAN, GasTerra, BAM Infra, Imtech, Gasunie, TenneT, Alliander, TNO and DNV KEMA.



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Eindhoven University of Technology (TU/e)

Built Environment

INSTITUTE

TU/e is a University of Technology in which various faculties work in the Smart Grids domain. The Faculty of the Built Environment is working to enable a sustainable, affordable and secure energy supply for the built environment.

RESEARCH

Office buildings are a potential source of energy flexibility which can be offered to the grid as a virtual power plant (VPP) to reduce uncertainty and optimize interaction with the smart grid. Options for energy storage at different levels in the built environment will be investigated with the combination of traditional process control and multi-agents systems.

NETWORKS

The Smart Grid research is part of the research programme Building Physics and Services of the Faculty of the Built Environment of the TU/e (TU/e-BE) and the research programme

on Smart Grids of the Faculty of Electrical Engineering of the TU/e (TU/e-EE). There is cooperation within the research programme of the UvA Centre for Energy Studies as well as that of CWI.

At the European level, there is participation in the Eindhoven Energy Institute KIC Sustainable Energy: InnoEnergy, cooperation with KTH, KUL and UPC. The project participates in the European University Alliance of Science and Engineering programme in which DTU, EPFL and TUM cooperate.

PROJECTS

- STW Smart Energy Systems
- Smart Energy Regions Brabant
- TKI Switch2SmartGrids SG (B2B & B2C) BEMS
- TKI Energo UCER



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Eindhoven University of Technology (TU/e)

Electrical Engineering / Electrical Energy Systems Group

INSTITUTE

The Department of Electrical Engineering is one of the nine departments of the Eindhoven University of Technology. As far as smart grids are concerned, not only the Electrical Energy Systems group but also the Control Systems group, the Electro-Optical Communication Systems group and the Electromechanics and Power Electronics group are active within the Department.

RESEARCH

The main topics of research on smart grids within EES involve systems architecture, grid optimization and handling power quality issues via modelling, analysis and simulation, monitoring and data management. The utilization of agent-based techniques applied in conjunction with ICT is becoming a major area of expertise of the group, along with the Virtual Power Plant concept to control and manage the distributed energy resources, including flexible loads (Demand Response). The impact of future

developments on the demand for network capacity and matching capacity of existing grids with these future demands is widely studied. Research on energy management is being carried out on houses, offices and districts.

NETWORKS

Collaborations are institutionalized within the Department (Centre for Power & Energy), within the University (Eindhoven Energy Institute), and outside the University (Dutch Power, EMVT, Energy Hills, KIC InnoEnergy).

PROJECTS

- IOP-EMVT IdeaNed, Intelligente Energiehuishouding
- EU FP7 E-price, INCREASE
- STW SES COCAPLEN
- Smart Energy Regions Brabant
- IPIN PMCII, Modinet, YEM
- TKI Switch2SmartGrids SG (B2B & B2C) BEMS, PV SIMS, SEC-USEF, tDASE



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Erasmus University Rotterdam

Dutch Research Institute for Transitions (DRIFT)

INSTITUTE

DRIFT is the leading research institute in transitions towards sustainability. DRIFT combines cutting edge research at the intersection of theory and practice with high-level consultancy and training programmes for governmental institutions, businesses and intermediary organisations. The main focus of its work is 'transitions'; structural systemic changes resulting from complex interactions in multiple domains and at multiple levels of society. DRIFT has two interrelated objectives. Firstly, it is constantly advancing transition theory, through developing new insights into transition dynamics and the way transitions can be understood and explained. Secondly, DRIFT puts theory into practice by implementing and further developing the Transition Management methodology. Reflexively experimenting with this innovative governance approach, DRIFT aims to influence transitions towards more sustainable pathways and accelerate their

pace. Action research allows DRIFT to test theories and concepts in practice while also learning from this practice. Thereby, theory feeds practice and vice versa.

RESEARCH

Regarding smart grids, DRIFT focuses on the societal interactions around such technology and its enabling role in the energy transition. Not the technology itself is central to DRIFT's research, the focus is rather on its societal context, i.e. the way it is adopted in society, how technology enables and shapes the transition; and vice versa: how societal developments also shape smart grid technology.

NETWORKS

- Intelligent Grids Innovation Programme (IPIN)
- Next Generation Infrastructures (NGI)
- Het Groene Brein

PROJECTS

- IPIN EVANDER
- NGI self-organisation of infrastructure
- NGI Spontaan Samenwerken
- TRAPESES

<http://www.drift.eur.nl/?p=7584>



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Hanze

University of Applied Sciences

INSTITUTE

The Hanze University of Applied Sciences aims to be, from a European perspective, the most important partner for businesses and organisations in the area of higher education in the north of the Netherlands in training professionals and developing applied and practice-oriented knowledge.

RESEARCH

Hanze University of Applied Sciences endeavours to empower consumers to be able to meet their energy needs in an increasingly sustainable and socially acceptable manner. This is achieved by contributing to the development of the integration of the demand and supply-driven energy worlds. Three professorships (Grid Integration, Renewable Energy and Energy Applications) are in place and three professorships are under development (Energy and Law, Energy and Entrepreneurship, Energy and Management); these lead to the development of research and innovation programmes

based on the concept of People in Power. In these programmes students (bachelor, master and PhD), lecturers, knowledge institutes and other stakeholders co-operate to enable energy transition: implementing renewable energy sources and energy efficiency in the community. The aim is always to develop, exchange and implement expertise and make a real difference in the community.

NETWORKS

Topconsortium Kennis & Innovatie (TKITKI SWITCH2SmartGrids), Energy Valley, Knowledge4Innovation

PROJECTS

- I-Balance, Balancing local consumption and production of energy; Flexible integration of decentralised energy in the electricity and gas network; Developing an integral energy model for balanced and flexible integration of decentralised energy. www.i-balance.org
- Flexigas, is involved in the development

and analysis of the components and component interactions necessary for the use of a smart, flexible and decentralised biogas grid. www.flexigas.nl



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High Tech Campus Eindhoven

COMPANY

Each company at High Tech Campus Eindhoven shares a common goal: developing new technologies and applications that help solve social problems and challenges, and successfully bringing these to the market. Multinationals like Philips, NXP, Intel, ABB, small and mid-sized high tech firms, research institutes, service companies and techno start-ups collaborate on tomorrow's technologies and products. Together, more than 10,000 international researchers, developers and business people at the Campus create a huge amount of knowledge and dynamism. They have turned High Tech Campus Eindhoven into one of the global hotspots in the areas of Health, Energy and Smart Environments. Turning Technology Into Business

SERVICES

As a resident, you have access to high-tech equipment for collaborative research, as well as laboratories and expertise. Furthermore, open innovation partnerships, such as Solliance (alliance of TNO, TU/e, Holst Centre,

ECN, imec and Forschungszentrum Julich for research and development in the field of thin film photovoltaic solar energy), accelerate the process of developing new technologies and bringing innovations to market.

NETWORK

The network of support functions and high-tech specialists, and close ties with investors, allows you to quickly and easily start up commercial collaborations within

High Tech Campus Eindhoven. Take into account the Open Innovation partnerships between industrial partners and you have a strong network of companies working together as partners, suppliers and customers. All these collaborations and activities transform the Campus into a 'networked community'.



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HAN

Hogeschool van Arnhem en Nijmegen

INSTITUTE

HAN University of Applied Sciences (HAN) offers higher education of an outstanding quality in an inspiring, innovative and international environment. We strive to prepare our students to meet today's challenges of globalisation, by combining unrivalled quality practical education with carefully specialised coaching delivered by skilled professionals. Review committees have recently ranked the courses offered at HAN in the top 10 of all Dutch Universities of Applied Sciences. From our campuses in Arnhem and Nijmegen, we provide 65 Bachelor's and 21 Master courses to approximately 30,000 students. We currently boast 2,100 international student enrolments from over 70 different countries!

RESEARCH

Solar power, wind energy, electricity from waste heat: the global demand for renewable energy sources such as these is increasing.

The trend towards the 'electrification of society' is visible everywhere.

This trend calls for new, innovative ways to decentralise the generation of electricity, for better decentralised energy storage, and for regulation of the effects on the stability of the power grid: both the national smart grid and mini off-grid power units. HAN develops and shares knowledge about such innovations in the field of electrical energy through its Research Group of Control Systems Engineering and the Sustainable Electrical Energy Centre of Expertise (SEECE). The Research Group also does research at the interface between energy and mobility. In this way, the group contributes to two key priorities of the HAN: sustainable energy and automotive applications. The emphasis is on the design, development, testing and validation of control systems and concepts. This research also enhances the quality, efficiency, reliability and cost-effectiveness of energy systems.



NETWORKS

- Energy Made in Arnhem
- EnergieNext
- Euregio KlimaEnergie 2020
- Experts Duurzame Gebiedsontwikkeling
- FlexiNet
- Gelderland Valoriseert
- Netbeheer Nederland
- Power to Nijmegen
- SEECE

PROJECTS

- SOPRA: Smart Grids and Decentralised Electricity Storage
- CSGrip
- Fast and Curious

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Hogeschool Zuyd

NEBER Centre of Expertise

INSTITUTE

NEBER Centre of Expertise (New Energy Built Environment and Renewables) is part of Hogeschool Zuyd and fills the gap between government, companies, education and knowledge institutions in the field of building. NEBER aims to build a bridge between various initiatives in order to help innovation in the built environment.

RESEARCH

Breakthrough solutions in the built environment in terms of energy transition prove to be complex processes. In Europe, 50% of the greenhouse gas emissions are caused by the built environment. On the other hand, large sums of money are being earned in the traditional energy sector. There is a gap between the realisation of smart breakthrough solutions and the interests of the current business. Another issue is that the building sector is rather conservative and in most cases private R&D resources are poor, there is a lack of

knowledge and a failing willingness to invest.

NETWORKS

NEBER is part of a knowledge infrastructure called BIHTS (building integrated high-tech systems) and is one of five pillars, the others being:

- a sustainable innovation and test centre of SGS;
- an Incubator for high-tech systems;
- a Real Life Lab for the built environment;
- a regional funding programme for the realisation of innovative ideas within SMEs.

The central goal of the infrastructure is to involve fundamental research and innovation of materials, products and processes in the field of renewable energy in the built environment.

PROJECTS

Projects focus on new products, processes and systems that contribute to the transition to a zero impact built environment. They also strengthen the economic development and

employment in the building sector. NEBER is the linking pin between fundamental research and businesses in the built environment.



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Saxion

University of Applied Sciences

INSTITUTE

Saxion is a University of Applied Sciences in the eastern part of the Netherlands with 25,000 students and 2,300 employees. The Research Centre for Urban & Environmental Development is one of the six research centres and contains eight different chairs.

RESEARCH

The Sustainable Energy Systems chair focuses on dealing with the current sources of energy more efficiently, in cooperation with companies and government. The main research themes are:

- Bio energy and bio based economy
- Energy and comfort: HVAC systems in near zero energy buildings
- Development of energy neutral areas

For these themes, a smart energy infrastructure is crucial. The chair focuses on smart heat grids, including virtual heat grids with heat and cold storage systems and heat pumps.

The Innovative Technology in Construction chair focuses on:

- Building Information Systems (BIM)
- Energetic retrofitting of buildings
- Concepts for Near Zero Energy Buildings

The chair is responsible for research regarding innovative technologies in construction, which takes place in cooperation with the construction sector and the Pioneering Foundation.

The final target for both chairs is an energy-neutral built environment in 2050 for all new and existing buildings. The role of a smart energy infrastructure is important in this transition to energy neutrality.

NETWORKS

Related to smart energy buildings and areas, Saxion is working together with three open innovation centres:

- Pioneering
- SETS
- KDG00



PROJECTS

- Het energieneutrale gebouw (SETS project in development)
- Bothoven Smart heat Grid (SETS project in development)
- Duurzame Intelligente gebouwen (Technology For Future (TFF) project)
- Intelligente Duurzame Demontabele KlimatiseringsSystemen (Technology For Future project in development)

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Tilburg University

INSTITUTE

Tilburg University (TiU) is a specialized research university among Europe's best in Business, Economics and Law. Through top-level research, it wishes to contribute towards a better society.

Interdisciplinary research relevant for smart networks is conducted within the following five institutes:

- Tilburg Institute for Behavioral Economic Research (TIBER) www.tilburguniversity.edu/research/institutes-and-research-groups/tiber/
- Tilburg Institute for Law and Economics (TILEC) www.tilburguniversity.edu/research/institutes-and-research-groups/tilec/
- Tilburg Institute for Law, Technology and Society (TILT) www.tilburguniversity.edu/research/institutes-and-research-groups/tilt/
- Tilburg Sustainability Center (TSC) www.tilburguniversity.edu/research/institutes-and-research-groups/tsc/
- TiasNimbas Business School, Real Estate Lab www.vastgoedlab.nl

RESEARCH

Research interests of the institutes include: the psychological processes underlying individual choices and economic decision making from an interdisciplinary perspective of economics, psychology and marketing (TIBER); privacy concerns related to smart meters (TILT); regulation of smart energy markets, decentralized market mechanisms, retail contracts, and investment incentives (TILEC); effects of energy labelling, and estimation of energy rebound effects (Real Estate Lab /TSC).

PROJECTS

Tilburg University has conducted many projects for government agencies, industrial partners and other stakeholders. The majority of those projects answer a particular policy question using insights from fundamental research, economic lab experiments and econometric analysis.



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TNO

INSTITUTE

TNO is an independent organisation for applied research. TNO connects people and knowledge to create innovations that improve the competitive strength of industry and the welfare of society. TNO's more than 4000 professionals work on five societal themes including Energy. Through innovations, TNO is working to ensure a sustainable, affordable and reliable supply of energy.

RESEARCH

TNO has the largest smart energy systems research team in the Netherlands. One of its strengths is the unique combination of technical expertise and experience in social innovations. TNO has a practical approach towards energy innovations, combining ICT knowledge with knowledge of energy markets and networks in numerous field pilots. Social innovations centre around end-user behaviour, multi-stakeholder business modelling and studies in regulation and legislation. This, together with TNO's expertise in IT-processes such as billing and

sensing, forms the key expertise for facilitating the energy transition.

One of the key innovations of TNO is the Powermatcher. With this innovation, matching electricity supply and demand becomes more efficient. The Powermatcher is currently being used in smart grids projects like Powermatching City (Groningen), Couperus (The Hague) and EcoGrid (Denmark).

NETWORKS

- Actively involved in EU FP7/EIT-ICT Labs/ KIC InnoEnergy Projects and in NEN, CEN/ CENELEC, ETSI
- Member of the European Energy Research Alliance (EERA) joint programme on Smart Grids
- With the Flexible Power Alliance Network (FAN) TNO is working on an open standard for connecting energy devices and energy applications. Also through this industry alliance the Powermatcher has been made available for the market.
www.flexiblepower.org

PROJECTS

- Ecogrid: www.eu-ecogrid.net
- PowerMatching City:
www.powermatchingcity.nl
- Advanced: www.advancedfp7.eu
- Solaroad: www.solaroad.nl

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University of Amsterdam

Centre for Energy

INSTITUTE

The Centre for Energy (CfE) of the University of Amsterdam is an independent and interdisciplinary research centre. Research and education are aimed at the public and private energy systems, with emphasis on decentralized and sustainable forms of energy systems dedicated to the end user. Since its establishment in 2010, the Centre has organized conferences and master classes, and published many articles on for example the Third Energy Package, smart grids and energy regulators.

RESEARCH

Changes in the energy system, liberalization, the internal market, local sustainable energy functions and consumers and generators, with emphasis on household consumers, are central to the research conducted by the Centre. In an interdisciplinary setting, it is aimed at identifying research questions relating to energy, energy supply and efficiency, sustainability and contemporary

techniques and physics, policy and law. A core subject relates to smart grids, the involvement of households therein, business models and the functioning thereof in practice.

NETWORKS

- Cooperation with TNO, an independent innovation organisation
- Various local authorities, such as municipalities and provinces
- Societal stakeholder representatives such as the Dutch Consumer Organisation, the Association of Home Owners and the Association for Energy, Environment and Water

PROJECTS

- Report commissioned by Agentschap NL 'Smart grid pilots. Handvatten voor toepassing van wet – en regelgeving. Deel I en II'
- IRIS 'Institutionele en regulatorische innovatie ten behoeve van lokale, slimme

energievoorzieningen'

- Report commissioned by Agentschap NL 'Inventarisatie juridische vragen en belemmeringen IPIN-projecten'



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University of Groningen (RUG)

Distributed Systems

INSTITUTE

Energy is one of the three main research themes of the University of Groningen (RUG). The RUG aims to make major contributions to the transition to sustainable production and consumption of energy. Smart grids is one of the key topics of interest.

RESEARCH

The Distributed Systems group is part of the Johann Bernoulli Institute for Mathematics and Computer Science of the Faculty of Science. Its mission is to perform fundamental research at the frontier of dynamic, distributed, complex information systems using formal engineering tools, and to seek applications with societal impact. Smart Grids and related applications for saving energy in buildings and homes are a core research topic of the group.

On Smart Grids the group investigates the evolution of the topology of the physical network with the goal of designing

topologies of medium and low voltage grids which are particularly suited to distributed generation. At the building level, the group is active in creating automation solutions to save energy and to take advantage of smart grid concepts such as real-time pricing and distributed generation.

NETWORKS

Group members take part in Energy Academy Europe, EU initiative on Global System Science/Energy, EU RC Energy Petten, Agentschap missions on Smart Grids Korea, Taiwan, USA, to name a few.

PROJECTS

- EU FP7 GreenerBuildings project
- NWO Smart Energy Systems: Energy Smart Offices
- NWO JSTP China-Dutch Dialogues: Energy and Services
- Ubbo Emmius scholarship: Smart Grid Peer to Peer Architectures
- IBM PhD Fellowship: Smart Grids



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University of Groningen (RUG)

Energy Law

INSTITUTE

Energy is one of the three main research themes of the University of Groningen (RUG). The RUG aims to make major contributions to the transition to sustainable production and consumption of energy. Smart grids is one of the key topics of interest.

RESEARCH

The Groningen Centre of Energy Law (GCEL) is part of the Faculty of Law, and studies the entire energy chain, 'from well head to burner pit', i.e. all legislation applying to the production, transmission and supply of energy, whilst taking into account the need for market liberalization, the promotion of renewable energy sources and the long-term security of energy supply. As the impact of renewable energy sources on energy networks is key to these developments, research focusses on the development of offshore electricity networks and smart grids. See www.gcel.nl

NETWORKS

- Groningen Energy and Sustainability Programme, www.rug.nl/research/energy
- The Groningen Energy and Sustainability Programme (GESp) coordinates all research and teaching concerning 'energy' within RUG, and facilitates cooperation with other knowledge institutes, governments and industry.
- Energy Academy Europe, www.energyacademy.org
- Nederlandse Vereniging voor Energierecht (Dutch Energy Law Association), www.never.nl
- North Sea Energy Law Programme (NSELp) is a joint programme offered by the Universities of Groningen, Copenhagen, Oslo and Aberdeen. www.nselp.eu
- Academic Advisory Group of the Section of Energy, Environment, Resources and Infrastructure Law of the International Bar Association, www.ibanet.org/LPD/SEERIL/AcademicAdvisoryGroup.aspx



PROJECTS

- The use of new and/or renewable resources and its consequences for networks www.edgar-program.com
- Developing a Transnational Electricity Infrastructure Offshore, www.nwo.nl/onderzoek-en-resultaten/onderzoeksprojecten/46/2300158446.html
- Synergies at Sea – Integrated Offshore Electricity Infrastructure [www.tki-windopzee.nl/files/2013-07/General%20Presentation%20TKI%20Wind%20op%20Zee%20\(3\).pdf](http://www.tki-windopzee.nl/files/2013-07/General%20Presentation%20TKI%20Wind%20op%20Zee%20(3).pdf)

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University of Groningen (RUG)

Environmental Psychology

INSTITUTE

Energy is one of the three main research themes of the University of Groningen (RUG). The RUG aims to make major contributions to the transition to sustainable production and consumption of energy. Smart grids is one of the key topics of interest.

RESEARCH

The environmental psychology group studies behavioural aspects and acceptability of smart grids. Important topics are: how should smart grids be designed to promote smart energy use (including energy savings, matching energy demand to supply), and which financial and social incentives are effective in order to realise this? How acceptable are various smart grid concepts, such as monitoring and control technology?

See for relevant publications:

www.rug.nl/staff/e.m.steg/research.

Important topics are:

- Reviews of effective behaviour change strategies.

- Reviews of factors influencing the acceptability of energy transitions.
- Research on the effects of various types of feedback and incentives on active participation in smart grids.
- Research on effects of bottom-up community approaches on active participation in smart grids.

NETWORKS

- Groningen Energy and Sustainability Programme, www.rug.nl/research/energy
The Groningen Energy and Sustainability Programme (GESP) unites research and teaching in this field within the RUG and facilitates cooperation with other knowledge institutes (including the Energy Academy Europe), government bodies, the business world and social/public organisations.
- Energy Academy Europe
www.energyacademy.org
- International Association of Applied Social Psychology, www.iaapsy.org



- Virtual Community on Sustainability & Consumption
badm.au.dk/research/research-groups/sustainability-and-consumption

PROJECTS

- Smart grid: Rendement voor iedereen
www.smartgridtv.nl
- MAPPING the contextual Conditions of RESilient Decentralized Energy Systems – MACREDES
www.edgar-program.com
- Tailored information technology to reduce residential energy use
www.agentschapnl.nl/subsidies-regelingen/gammaonderzoek/praktijkvoorbeelden/intewon
- Psychological aspects of future electricity supply: the role of Smart Storage

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University of Groningen (RUG)

Systems and Control Engineering

INSTITUTE

Energy is one of the three main research themes of the University of Groningen (RUG). The RUG aims to make major contributions to the transition to sustainable production and consumption of energy. Smart grids is one of the key topics of interest.

RESEARCH

The Systems and Control Engineering group of the Industrial Technology and Management institute of the faculty of Mathematics and Natural Sciences studies control engineering solutions for the future grids. Important topics are: design of distributed control algorithms for supply-demand matching via dynamic pricing (or dynamic incentives) with proven stability results for the embedding of new energy systems in the grid, frequency and voltage stability of the grid via energy and power based modelling methods, control algorithms that are robust against fluctuations, and failures of new and existing

energy systems. See for relevant publications:
www.rug.nl/staff/j.m.a.scherpen/research
www.rug.nl/staff/c.de.persis/research

NETWORKS

- Groningen Energy and Sustainability Programme, www.rug.nl/research/energy
The Groningen Energy and Sustainability Programme (GESp) unites research and teaching in this field within the RUG and facilitates cooperation with other knowledge institutes (including the Energy Academy Europe), government bodies, the business world and social/public organisations.
- Energy Academy Europe
www.energyacademy.org
- IEEE Control Systems Society
www.ieeecss.org
- International Federation of Automatic Control, IFAC, www.ifac-control.org



PROJECTS

- Distributed control in the new gas chain.
<http://www.edgar-program.com>
- Forecasting, planning and stability of smart energy systems. http://www.rug.nl/research/discrete-technology-production-automation/projects/forecasting_-planning_-stability-of-smart-energy-systems
- Windmill energy efficiency, EDGE.
<http://www.rug.nl/research/smart-manufacturing-systems/researchprojects/edge>
- Control, metering and pricing of thermal networks, Flexiheat. <http://www.rug.nl/research/smart-manufacturing-systems/researchprojects/flexiheat>
- Energy-based analysis and control of the grid: dealing with uncertainty and markets (ENBARK).
- For a popular description of the project, please see page 22-23, of <http://www.rug.nl/alumni/stay-involved/broerstraat-5/pdf/broerstraat5-2014-2.pdf>

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University of Twente

CTIT

INSTITUTE

Research in the area of ICT of the University of Twente is organized within the Centre for Telematics and Information Technology (CTIT). It is one of the largest academic ICT research institutes in Europe, involving more than 475 researchers. Research on ICT for Smart Grids is one of the strategic research orientations of the CTIT.

RESEARCH

To meet the growing demand for renewable power, an intelligent and flexible grid infrastructure will be essential, integrating smart generation, smart appliances and smart buildings. In traditional power grids, power generation follows load, whereas in the future, power consumption will follow generation; for example electric cars that can be charged at night using cheap wind power. This means we are heading for a paradigm shift, in which unidirectional energy and communications flows are renounced in favour of bidirectional power flows.

The research focus of the team is energy management for energy-autonomous smart micro-grids. Important reasons why we perform research on autonomous smart micro-grids are: improved peak load reduction, improved security of supply, resistance against cyber-security attacks, and higher penetration of renewable and distributed generation.

NETWORKS

- EIT ICT labs
- TKI Switch2SmartGrids
- 3TU NIRICT

PROJECTS

- DREAM (STW funded)
- i-CARE (STW funded)
- SOWICI (STW funded)
- e-Balance (EU FP7 funded)
- IPIN IN4Energy: Lochem Energie (Agentschap NL)
- TKI Switch2Smartgrids project Meppel Energie (Agentschap NL)

- EASI project (STW funded)
- KITA Haren project (Funded by RWE)



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(TU Delft) Delft University of Technology

Delft Energy Initiative / PowerWeb

INSTITUTE

The Delft Energy Initiative is the portal to energy research, education and innovation at the TU Delft. Since dealing with the challenges of the current energy system towards a future sustainable system requires an interdisciplinary approach from electrical engineering, mathematics, computer science and policy analysis, the corresponding faculties jointly founded the PowerWeb consortium.

PowerWeb's mission: (1) to perform interdisciplinary research in the pursuit of realizing a robust and reconfigurable smart grid, (2), to team up and orchestrate TU Delft's projects on smart grids, and (3) to distribute knowledge on the topic of smart grids.

RESEARCH

Integrated study of the underlying physical systems ('the grid hardware'), the design of smart energy management systems ('the grid software'), and the study of smart grids in relation to their societal and economic

environment ('the grid users'), in order to model and implement integrated energy production and consumption services in a robust manner.

NETWORKS

- Actively involved in European FP7 community
- Next Generation Infrastructures
- Erasmus Mundus Joint Doctorate in Sustainable Energy Technologies and Strategies
- Involved in writing of the NIRICT Strategic Research Agenda on Smart Grids
- Participation in smart grids mission to USA and Japan
- Many industrial contacts, among which Alliander, Tennet, DNV Kema, TNO, Siemens, Phase2Phase, JRC Petten
- Energy Delta Gas Research (EDGaR)

PROJECTS

- Several PhD projects funded by Alliander as in 'Energy data deluge', 'Dynamic Capacity

Control and Balancing at MV', 'Vulnerability', and many more

- EU FP7 projects UMBRELLA: www.e-umbrella.eu and SESAME: www.sesame-project.eu and City-Zen
- GreenVillage: www.thegreenvillage.org
- Topsector Energy TKI-Switch2Smartgrids project 'Warmteweb'
- Several NWO projects, including 'Uncertainty Reduction in Smart Energy Systems (URSES)' and Maatschappelijk Verantwoord Innoveren

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Utrecht Sustainability Institute (USI)

INSTITUTE

The USI mission is to bundle know-how on sustainability issues in the urban environment in the Utrecht region, and to relate it to the practical situation in cooperation with companies, government bodies and societal organisations. This takes place via projects ranging from strategic advisory processes to innovation projects.

RESEARCH

USI develops or contributes to the development of these projects. Within such projects, the bundling of know-how and knowledge dissemination is the key competence of USI. An example is the 'Smart Grid: returns for all' project in which innovative smart grid services are developed and tested in pilots in Amersfoort and Utrecht.

NETWORKS

TKI Switch2SmartGrids; Smart Grid Nederland.

PROJECTS

Smart Grid: returns for all, see www.smartgridrendement.nl. This project develops and tests a series of new, scalable services, supported by the users, around electricity networks of the future. The tests are under way into medium-sized smart grids of 100 households each, in Amersfoort and Utrecht. Working in existing neighbourhoods and with intensive resident participation

allows us to reach co-creation of services which are truly useful to the residents. New knowledge and insight gained in terms of development of services is actively shared during the course of the project, in order that both the regional economy and society can benefit optimally. Implementation of and sharing of knowledge concerning such services concepts helps to accelerate the energy transition and the resultant CO₂ reduction.



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Utrecht University

Copernicus Institute

INSTITUTE

Utrecht University is an internationally renowned research university conducting fundamental research covering a wide variety of scientific disciplines. Utrecht University makes active contributions to the development of a more sustainable society by disseminating scientific knowledge and by serving as an inspiring model of sustainability. One of its four strategic themes is sustainability, with the Copernicus Institute of Sustainable Development as a central pivot.

RESEARCH

At UU Copernicus, a wide range of expertise in the field of renewable energy systems is combined. There is top-down assessment of smart grid development in developing future road maps as well as bottom up approaches such as development of ICT for local energy management systems with electric vehicles and photovoltaic systems. The changing roles of various stakeholders

are also addressed and are in fact key to the successful transition to renewables.

NETWORKS

- Actively involved in several TKI projects
- Member of NEN, CEN/CENELEC, TC82
- Associate member of European Energy Research Alliance

PROJECTS

- Smart Grids: rendement voor iedereen (TaskForceInnovatie Utrecht): developing business models for smart grids
- In addition, Copernicus is partner in the TKI-Switch2Smartgrids project
- Solar forecasting and smart grids (TKI-Switch2Smartgrids): a PV yield prediction system is being developed together with DNV Kema and Ecofys.
- Advanced Solar Monitoring (TKI-Solar Energy) together with Soluzon, Aurum and Solar Energy Application Centre, tools are developed to combine 'Big Data' streams of PV and (household) energy demand data.

- IEA-PVPS (International Energy Agency – Photovoltaic Power Systems) – Task 13: analysis of performance of PV systems .
- M.Sc. students have been active in smart grid modelling, using Triana, a control strategy for Smart Grids developed by Vincent Bakker of University of Twente.



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